

THE BELGIAN NAVY

Thomas R. Mooney

DUDDLEY KNOX LIBRARY
NAVAL POSTGRADUATE SCHOOL
MONTEREY, CA 93940

NAVAL POSTGRADUATE SCHOOL

Monterey, California



THESIS

THE BELGIAN NAVY

by

Thomas R. Mooney

March 1979

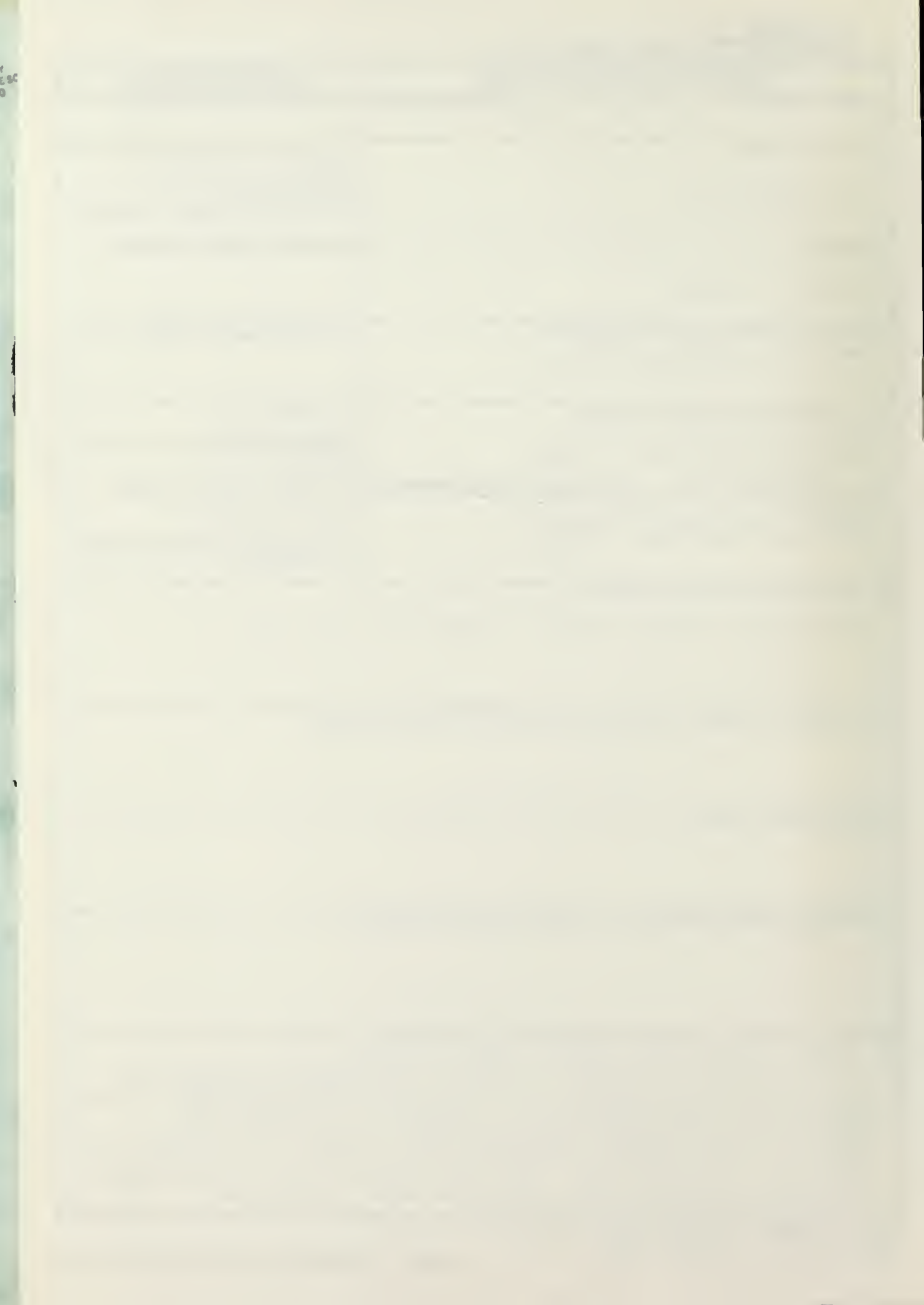
Thesis Advisor:

D. P. Burke

Approved for public release; distribution unlimited

T188662

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) The Belgian Navy		5. TYPE OF REPORT & PERIOD COVERED Master's Thesis March 1979
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Thomas R. Mooney		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS Naval Postgraduate School Monterey, California 93940		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Naval Postgraduate School Monterey, California 93940		12. REPORT DATE March 1979
		13. NUMBER OF PAGES 195
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) Naval Postgraduate School Monterey, California 93940		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The United States Navy no longer possesses the number of ships required to execute all its responsibilities under existing military security agreements. Therefore, the assets and capabilities of America's smaller naval allies could weigh heavily in the balance determining the success or failure of an East-West confrontation. Unfortunately, the bulk of knowledge comprising Western naval literature lacks the detailed		



information on small navies which is necessary to evaluate their ability to make a meaningful contribution to NATO. Through a descriptive analysis of the Belgian Navy, this paper attempts to show that a small navy can make a significant contribution to the allied naval effort. In addition, this thesis is submitted as a contribution to the body of Western naval literature by presenting in English a comprehensive description of the Belgian Navy heretofore available only in Dutch and French language sources.



Approved for public release; distribution unlimited

The Belgian Navy

by

Thomas R. Mooney
Lieutenant Commander, United States Navy
B.A., Park College

Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF ARTS IN NATIONAL SECURITY AFFAIRS

from the

NAVAL POSTGRADUATE SCHOOL
March 1979

ABSTRACT

The United States Navy no longer possesses the number of ships required to execute all its responsibilities under existing military security agreements. Therefore, the assets and capabilities of America's smaller naval allies could weigh heavily in the balance determining the success or failure of an East-West confrontation. Unfortunately, the bulk of knowledge comprising Western naval literature lacks the detailed information on small navies which is necessary to evaluate their ability to make a meaningful contribution to NATO. Through a descriptive analysis of the Belgian Navy, this paper attempts to show that a small navy can make a significant contribution to the allied naval effort. In addition, this thesis is submitted as a contribution to the body of Western naval literature by presenting in English a comprehensive description of the Belgian Navy heretofore available only in Dutch and French language sources.

TABLE OF CONTENTS

I.	INTRODUCTION.....	11
II.	THE BELGIAN MARITIME HERITAGE.....	15
	A. OVERVIEW.....	15
	B. THE ROYAL BELGIAN NAVY - 1831-1862.....	17
	C. THE CORPS OF SEAMEN AND TORPEDO BOATS - 1917-1926.....	23
	D. THE ROYAL NAVY SECTION BELGE - 1941-1945.....	28
	E. THE BELGIAN NAVY.....	34
III.	NAVAL MISSIONS AND OPERATIONS.....	40
	A. OVERVIEW.....	40
	B. THE BELGIAN DEFENSE POLICY.....	45
	C. NATO COMMITMENTS.....	46
	D. NATIONAL MISSIONS.....	52
	1. Primary Mission Areas.....	52
	a. Protection of Belgium's Sealines of Communications and Assistance to the Merchant Fleet.....	52
	b. Coastal Security and Sanitation of Vital Sealanes.....	55
	c. Coastal Surveillance and Interdiction.	57
	d. Fisheries Protection and Control.....	58
	e. River Surveillance and Control.....	60
	2. Secondary Mission Areas.....	61
	a. Search and Rescue.....	61
	b. Explosive Ordnance Clearance and Demolition.....	61
	c. Sea Control.....	62

	d. Intelligence Collection.....	64
	e. Oceanographic Research and Data Collection.....	65
	f. Show the Flag/Goodwill Cruises.....	66
	E. TEMPO OF OPERATIONS.....	68
IV.	THE BELGIAN FLEET.....	76
	A. OVERVIEW.....	76
	B. FRIGATE SQUADRON 181.....	80
	1. Frigate Capabilities.....	81
	2. Standardization and Cooperation.....	82
	3. Operational Program.....	85
	C. MINE COUNTERMEASURES FLOTILLA 22.....	86
	1. Mine Countermeasures Support and Command Ships.....	90
	2. Ocean Minesweepers - Minehunters.....	91
	3. Coastal Minesweepers - Minehunters.....	93
	4. Inshore Minesweepers.....	93
	5. Trinational Minehunter Program.....	95
	D. OTHER FORCES.....	97
	E. FLEET TRAINING AND READINESS.....	98
V.	THE STRUCTURE AND ORGANIZATION OF THE BELGIAN NAVY..	102
	A. THE NATIONAL DEFENSE ORGANIZATION.....	102
	B. ORGANIZATION OF THE NAVY.....	104
	1. The Operations Command.....	106
	2. The Logistics Command.....	108
	3. The Instruction Command.....	113
	4. The Belgian-Netherlands Mine Warfare School.	115
	C. PERSONNEL.....	120

1. Education and Training Qualifications.....	122
a. Officer Personnel.....	122
(1) Officer Acquisition and Training.	124
(2) Officer Promotions.....	126
b. Enlisted Personnel.....	128
(1) Enlisted Personnel Acquisition and Training.....	130
(2) Enlisted Promotions.....	132
2. Women in the Navy.....	133
3. Personnel Shortages.....	136
4. Unionism in the Belgian Navy.....	141
a. The Evolution of Unions.....	142
b. Current Status and Purpose of Military Unions.....	145
D. NAVY FINANCES.....	147
1. The Navy's Operating Budget.....	148
2. The Navy's Investment Budget.....	150
3. Supplemental Appropriations.....	152
VI. CONCLUDING REMARKS.....	153
APPENDIX A THE BELGIAN NAVAL FLEET.....	164
FOOTNOTES.....	168
BIBLIOGRAPHY.....	185
INITIAL DISTRIBUTION LIST.....	194

LIST OF TABLES

I.	OPERATIONS OF THE BELGIAN NAVY - 1977.....	73
II.	NATO MCM FORCES.....	87
III.	BELGIAN NAVY PERSONNEL STRENGTHS.....	121
IV.	DAMARS IN THE BELGIAN NAVY.....	135
V.	SELECTED STATISTICS - NATO NAVY COUNTRIES.....	154
VI.	SUMMARY OF GENERAL PURPOSE NAVAL FORCES - 1977....	157



ILLUSTRATIONS

FIGURE

1. RELATIONSHIP BETWEEN NATO AND BENELUX NAVAL
COMMANDS..... 49

MAP

1. BELGIUM: LOCATION OF BELGIAN NAVAL FACILITIES.... 109
2. THE BENELUX NATIONS..... 155

ACKNOWLEDGEMENTS

I owe a principal debt of gratitude to the Naval Staff of the Belgian Navy without whose assistance this thesis would have been impossible. In particular, I wish to thank Vice-Admiral J.P.L. Van Dyck, Chief of the Naval Staff, and his Director of Plans and Programs who provided guidance, research materials, and encouragement during the design, preparation, and writing of this study. Additionally, I thank the countless number of personnel who spent many hours searching for research materials and answers to the many long lists of questions which I submitted to the Belgian Navy's Director of Plans and Programs.

A special debt of gratitude is acknowledged to the men and women of the Belgian Navy with whom I served during my two years in the Belgian-US Navy Personnel Exchange Program. Their professionalism, knowledge, and assistance was instrumental in allowing me to assimilate the intricacies of a foreign language and to learn a wealth of information about Belgium, the Belgian Navy, and, especially, Mine Warfare.

Although the Belgian Navy has graciously supplied the majority of the foreign language materials cited in this study, the views expressed in this thesis are solely mine; they do not reflect the official views of either the Belgian Navy or the United States Navy. Any misconceptions or factual errors are, of course, mine as well.

I. INTRODUCTION

While the Belgian Navy provides a significant contribution to NATO, it remains virtually unknown to naval personnel and military planners outside Belgium. The appalling lack of information on the Belgian Navy was first impressed upon this writer in 1975 while he was preparing to participate in the Belgian-U.S. Navy Personnel Exchange Program (PEP). No document existed which could provide the reader with an overview of the Belgian Navy. The Belgian Embassy in Washington, D.C. was helpful in providing booklets and miscellaneous data on the fleet, but it could not provide enough information to allow the interested reader to gain an appreciation of its country's navy. Finally, the Belgian Navy itself possessed no document for external distribution which treated the service in a comprehensive manner. There are many reasons for this, not the least of which is the small size of the Belgian Navy and the concomitant relative disinterest of major naval powers in their smaller counterparts. After all, who cares about the Belgian Navy? Can a small navy really contribute to the defense of NATO? Does a small nation, such as Belgium, even need a navy? This paper attempts to answer these and related questions by a primarily descriptive analysis of the Belgian Navy which relies heavily on Dutch and French language materials provided by the Belgian Ministry of Defense, the Belgian Navy, and friends of the author in Belgium.

Although objectivity has been attempted, the reader will detect a very strong pro-Belgian Navy bias on the part of the author. This is the result of experience gained while serving with the Belgians from August 1975 to August 1977 as a member of the first Belgian-U.S. Navy Personnel Exchange Program. The author served as the Operations Officer and the Mine Countermeasures Officer of the Belgian Mine Warfare Flotilla 22 and the flotilla flagship, BNS Zinnia (A-961). After a relieving process, much the same as in the U.S. Navy, I assumed all the duties and responsibilities of the operations and coordination of assigned flotilla units. Since the operations officer is intimately involved in all aspects of planning and execution of operations and missions, all sources and classifications of documents, plans, and programs were placed at my disposal with the exception of national cryptographic codes and contingency war plans. Therefore, I was able to gain an appreciation and deep respect for the capabilities of the Belgian Navy, not only as an observer, but also as a full participant. Furthermore, I have gained an even greater degree of admiration for this small navy in the evolution of this study as I drew together pieces of information from many previously overlooked and unknown sources.

The Belgian Navy is small and limited in its capabilities. However, even those limited capabilities, when the Navy is integrated with other NATO forces, provide an increase in the quantity and quality of naval forces available to the allied naval effort. The serious decline in the number of

ships in the United States and British Royal Navies increases the importance of small navies simply because they represent additional forces in being. Furthermore, the importance of small navies is further heightened when their fleets are composed of highly sophisticated warships capable of being fully integrated into the various NATO naval commands. Finally, by virtue of their small size, these navies are forced to cooperate with their larger allies to build, equip, maintain, and operate their fleets in the most cost effective manner. The degree of cooperation required to ensure success of many small navy programs has resulted in increased communications between allies, a greater sharing of high technology, and a greater degree of standardization within NATO. This is an area where the Belgian Navy has, I believe, especially enriched allied defenses and the preparedness of NATO European naval forces. Although the degree of cooperation and integration falls far short of the earlier dreams of a unified European Defense Community, the present levels of joint operations, integrated planning, and consultation on all aspects of naval warfare, are significant steps in that direction.

Prior to this study, no other document, to my knowledge, provided a detailed description of the background, development and status of the Belgian Navy. These details are significant because a list of fleet units does not provide the vital information, such as training and

readiness, experience levels, and the tenacity and will to execute its missions, which is necessary to evaluate a navy's contribution and capabilities. It is incumbent upon the United States to possess and evaluate this information, regardless of the size of a small navy's fleet, and to make this information available to its naval personnel and other interested students of naval affairs.

The basic outline of this study is dictated by the need to understand the background, development, and finally, the current status of the Belgian Navy, in order to evaluate its contribution to Belgium and to NATO. It is presented to enable U.S. Navy Personnel, who participate in the Belgian-U.S. Navy PEP Program, an opportunity to familiarize themselves with the Belgian Navy prior to their departure from the United States, and to assist naval planners by providing them the comprehensive information required to assess the Belgian Navy in the context of NATO plans and programs.



II. THE BELGIAN MARITIME HERITAGE

A. OVERVIEW

Belgium, unlike its Dutch neighbor to the north, was never a great sea power. At its formation in the 1830's, Belgium shared many similarities with the Netherlands to which it was roughly equivalent in size and population, but Belgium had no ambition to become a major shipping or naval power. Instead, a fortuitous location with abundant quantities of water and other natural resources allowed Belgium to become a leader in the industrial revolution. Commercial and trade interests were, especially in the ward of Antwerp, closely linked with the nation's former ruler, the House of Orange.¹ The provisional government believed that any attempt to challenge the naval supremacy of the Netherlands, let alone England and France, would have threatened the survival of the country as an independent state.

The fledgling Belgian nation was preoccupied with the need to organize the complicated elements which constitute the machinery of the state. Political leaders were overwhelmed by the requirement to hold their delicate coalition government together. All decisions concerning the establishment of a military naval force were repeatedly

set aside. Besides, the treasury was exhausted and no funds were available to make the necessary procurements for a navy.

Although the government clearly understood the need of a naval force to protect its merchant shipping and coast, it did not understand the importance of a navy in the achievement of political objectives. The Royal Belgian Navy was not established until January 1831 when the crisis of the closing of the Scheldt River by the Dutch required a strong reaction from Belgium to protect its national interests. However, the new navy was never equipped satisfactorily to ensure a first-rate war-fighting capability. In general, ships provided to the navy tended to be either new vessels rejected by the merchant fleet due to structural deficiencies or old merchant vessels no longer fit for service, plus several cannon boats taken from the Dutch when the Citadel of Antwerp fell on 23 December 1832.²

The history of the Belgian Navy from 1830 to 1946 is a series of half-measures executed in times of impending crisis. The actions of the government were always too little, too late, which resulted in the nation being continually unprepared to provide adequate coastal defense and protection to its merchant fleet. The existence of the navy depended on the whims of the parliament despite ardent support from the monarch who wanted to provide the nation with a navy capable of carrying out colonial schemes

and providing the nation the protection it required. Consequently, Belgium has had four separate naval forces during the past 149 years, only two of which could be rightly called a navy. Each of these naval forces is addressed below because the impermanance of the antecedents of the present navy has contributed to the permanance of the Belgian Navy today.

The heritage of the Belgian Navy lies not in its past grandeur, but rather in the ardent and persistent efforts of its ancestors to provide a suitable naval force to protect Belgium's coast and its commercial interests. Armed neutrality without a navy was considered to be nothing more than naked neutrality by the proponents of a navy. The navy's ancestors clearly recognized that even a small navy, properly organized and equipped, would provide significant service to the nation in peace, as well as in war.³

B. THE ROYAL BELGIAN NAVY - 1831-1862

The Royal Belgian Navy represented a very modest and difficult beginning for the naval service in Belgium. The treasury was empty, the provisional government was pre-occupied with itself, and the nation had no high ranking naval officers with sufficient experience to adequately argue the case that Belgium needed a navy to protect itself. During the Dutch administration the Belgians had

been systematically excluded from navy squadrons, as well as the Engineer and Artillery Corps of the Kingdom of the Netherlands' fleet. In order to prevent Belgian officers from gaining sea experience and stature, they were assigned garrison duties in the cities. Unfortunately, the representatives of Belgium, while serving in the Kingdom's Congress, had not comprehended the practical utility and benefits of a navy. Consequently, no attempt was made to ensure complete Belgian participation in the Dutch navy.⁴

The guiding force behind the establishment of a Belgian navy was not even a Belgian, but rather, J. A. Gras, a veteran French naval officer who was an engineer for the Belgian shipyard Fleury-Duray. When Belgium declared itself independent on 4 October 1830, Gras already had a plan to seize the Citadel of Antwerp, the Netherlands' only remaining stronghold in Belgium. It was also a memorandum by Gras entitled, "On the Need to Establish a Naval Force in Belgium," which finally attracted some attention by the government and lay the foundation for the establishment of the Royal Belgian Navy.⁵

When the Dutch sealed off the mouth of the Scheldt River late in 1830, even the most hostile opponents of a naval force recognized the plight of the nation's economy and agreed that some kind of limited naval force was necessary. The provisional government appropriated funds to create a navy on 15 January 1831, and the Royal Belgian Navy was Established.⁶ On 24 February approval was granted

to construct two brigantines armed with cannons to defend the coast and rivers. Unfortunately, these first fleet units were designed using defective blueprints and found to be unserviceable when delivered.⁷ The navy had only four small schooners, each armed with four cannons, which were no match for the Dutch fleet. Proposals were made to purchase and refit old merchant vessels which would provide the navy with a limited war-fighting capability, but all of these plans were overcome by the events of the day. The newly formed navy was ill prepared to defend itself, let alone the nation. Fortunately, England and France intervened and forced Belgium and the Netherlands to accept an armistice under which Belgium was recognized as an independent state.

The armistice signed by Belgium and the Netherlands on 15 December 1830 was broken by the Dutch in August 1831.⁸ Dutch fleet units sailed up the Scheldt and sunk several Belgian merchant ships anchored off Antwerp but were unable to destroy the tiny Belgian fleet which escaped to Brussels through the inland waterways.⁹ Nevertheless, the war-fighting days of the Royal Belgian Navy were over because France and England decided to put an end to the hostilities between Belgium and the Netherlands. As guarantors of Belgium's independence they feared that, if it were allowed to continue, the fracas between the two nations would extend over all of Europe. The French army laid siege to the Citadel of Antwerp and forced

the Dutch to capitulate while a combined English and French fleet blockaded the coast of Holland and placed an embargo on Dutch shipping.¹⁰ Although tensions existed between Belgium and the Netherlands until April 1839, a war-fighting navy was determined to be unnecessary. Except for the continuous efforts of King Leopold I to develop the nation's economy through increased trade and colonial expansion, the navy would have been abolished long before 1862.¹¹

Throughout its 31 year existence the Royal Belgian Navy remained insignificant in size and priority. Although it rendered valuable services to the nation, only ungrateful indifference was offered to the navy. Naval personnel manned Belgian merchant ships due to the shortage of qualified merchant sailors, and the navy was responsible for the training and instruction of merchant seamen. The navy participated with the Ministry of Foreign Affairs to increase Belgium's foreign trade and its recognition as an independent nation. Fisheries protection cruises provided rescue and assistance services to the fishing fleet throughout the North and Irish seas. The first steamship line between New York and Antwerp was established in 1840 and entrusted to the navy for operation. Likewise the first cross-channel shipping line was inaugurated and maintained by naval officers and sailors. Moreover, in 1847 the first mailboat began operating between England and Belgium which provided a new era of communications

between Europe and the British Isles. The Navy helped the nation to compete successfully in the world economic community, and it was indispensable in executing Leopold's attempts to increase the prosperity of Belgium and to establish a colonial empire.¹² Despite all these successes Leopold and his navy had little visible success in prodding their government and nation to accept the fact that a substantial naval power was required to stimulate the nation's economy and protect the merchant fleet and nation. The government was determined to rely upon its status as an independent and perpetually neutral state.¹³

In spite of the above-mentioned services to the nation, the existence of the navy was constantly challenged. In 1844 an impassioned Father Foere declared that there were three reasons Belgium did not need a naval fleet. First, the nation was a neutral country protected by the might and power of several major naval powers. Second, Belgium had no colonies to protect and therefore required no navy. Finally, the extermination of piracy was being executed by the principal European powers with the most efficient means and measures available. Belgium could not hope to obtain the skills and ships necessary to protect its merchant shipping. The nation could rely upon the good services of its allies to assist Belgian ships in distress. There was no good reason to waste money on a naval force.¹⁴

The revolutions of 1848 triggered a war scare in Europe and resulted in further reductions in the support and budgets to the navy. In order to show the nation that fiscal and political responsibility was a serious goal of the government, it tightened purse strings and refused to approve urgent proposals for new navy ships to replace decommissioned vessels. Between 1853 and 1862 the parliament repeatedly debated the need for a navy. The representatives decided to allow the navy to starve itself out.¹⁵ Finally, in 1862, the government abolished the Royal Belgian Navy over the strong objections of the King and many loyal naval supporters. Naval personnel either found employment in the merchant marine or returned to their former occupations.¹⁶

Despite this turn of events, there existed in parliament a sizeable group of supporters for a navy. Periodically debates were held, and the dream of a navy remained alive. To ensure some naval expertise in the military, all able artillery officers were sent to the French navy for training.¹⁷ Nonetheless, Belgium possessed no capability to defend its coast and harbors.

Little more than a year after the abolition of the navy, the Scheldt River was declared open for free transit by all nations. In the absence of a navy Belgium was forced to rely upon its merchant marine and the army to ensure good order and safety within its territorial waters and rivers. By the turn of the century several armed

police boats were required to patrol the Scheldt River mouth, and it was with four similar boats that Belgium became involved in World War One. As will be seen, Belgium was not much better equipped in 1940. In both cases the nation was ill prepared to protect its neutrality, let alone to participate in a major war.

C. THE CORPS OF SEAMEN AND TORPEDO BOATS - 1917-1926

In 1865, shortly after the death of the Royal Belgian Navy, Leopold II ascended to the throne. The 30 year-old monarch had travelled throughout the world. He had bold visions of establishing an empire which would greatly expand his small nation's economy and international status.¹⁸ Leopold fully understood the importance of seapower to fulfill his dream. This is clearly illustrated in his statement that, "(n)o nation which touches the sea is small."¹⁹ He desperately wanted to establish his people on a maritime footing with a navy equal to his dreams. Although guided by the most enlightened minds of his times, such as Banning and Brialmont, Leopold was unable to find acceptance of his ideas. Nevertheless, he established the practice of sending army officers to train with the French navy to ensure some degree of naval expertise for his nation.²⁰

Unfortunately for Leopold and his naval supporters, the war scare created by the Franco-Prussian War of 1870

quickly subsided, leaving parliament more convinced than ever that their armed, perpetual neutrality could be safely guaranteed by the 1839 treaty without the additional expense of a navy.²¹

Shortly thereafter the government was embarrassed by not being able to carry out its responsibilities of patrolling the North Sea under the recently signed Hague Convention of 1882. The government, forced to rent merchant ships, eventually built the three masted bark "Stad Oostende" to carry out fisheries protection missions. In the meantime it recognized that the merchant fleet had fallen into a seriously deteriorated state due to the lack of experienced personnel. Formerly, the merchant fleet had been manned by recruits who had learned their trade while serving in the Royal Belgian Navy. The decay of the merchant fleet was viewed with alarm, producing many proposals to provide a corps of qualified personnel. All of these proposals ended in poorly administered programs which did little to alleviate the problem.²² Even with Leopold's great successes in Africa, which greatly increased Belgium's prosperity and stature, he was unable to convince the parliament that Belgium required a navy to protect his valuable Congo colony.

As war clouds gathered over Europe Leopold struggled with his recalcitrant parliament to gird the nation for the possibility of war. Although unsuccessful in gaining support for a naval force, Leopold finally received

approval for modernization and reform of the army.²³ Albert I succeeded to the throne in 1909 and was instrumental in establishing general military service one year ahead of the outbreak of the First World War.²⁴

When the war began, the government attempted to organize a small naval force to defend its coast and rivers but events progressed with such speed that time was not available to improvise. The nation's small gun boats were forced to flee to the Netherlands where they were interned by the neutral Dutch and lay at anchor until the armistice.²⁵

The only naval engagements involving Belgian forces took place in the Congo where several small boats battled superior German naval units on Lake Tanganyika and Lake Kivu. Although the meritorious and courageous efforts of this small "Colonial Military Navy" cannot be denied, the successes of this combined Belgian-French force had little impact upon the course of the war in Europe.²⁶

Since the Belgians had no means of maritime defense in 1914, it was only with the help of the French Navy that Belgium participated in the allied maritime defense effort. More than 400 Belgians served on board French naval ships during the last two years of World War One. Many of these sailors served on minesweepers where they acquired valuable experience which formed the basis of the Belgian Navy's subsequent expertise in mine warfare.²⁷

A personnel depot was created in 1917 to train crews for the supply ships of the army and to protect the coast.²⁸ After 1918 Belgian seamen had over 50 ships at their disposal including 11 torpedo boats and 26 mine-sweepers which had been abandoned by the retreating Germans.²⁹ A study commission, created by the General Staff to determine the usefulness and disposition of this small fleet, was favorably disposed to the re-establishment of the navy.³⁰ In spite of similar enthusiasm by the press and the public, the parliament gave a cool reception to the commission's recommendation. Instead, several interministerial commissions argued over the costs of coastal defense and the maintenance of a naval force suitable to that task. Parliament decided against creating a navy but authorized a Corps of Seamen and Torpedo Boats to replace the personnel depot.³¹

Unfortunately this naval corps was treated as a step-child of the army and never received the political and economic support necessary for its survival. In addition, the tide of public opinion had shifted from the euphoria of victory to the reality that the world had undergone a fundamental change. Men no longer flocked to join the military service and the nation faced an imminent shortage of merchant seamen needed to ensure economic recovery.³² The question of maintaining a naval force was again reviewed by a 27-member military commission composed of

supporters and opponents of a navy. After lengthy debates the commission voted 24 to 2 in favor of maintaining the small naval corps, with one member abstaining. Nevertheless, parliament decided that the military capabilities of the Corps of Seamen and Torpedo Boats were not worth the maintenance expenditures. The parliament further declared that since an adequate coastal defense force was beyond the limited means of the nation, Belgium would rely upon its neutrality, allies, and, to a much more limited extent, membership in the League of Nations for its security.³³ Consequently, the Corps of Seamen and Torpedo Boats was abolished on 9 July 1926.³⁴ The nation was once again without a coastal defense force while the many ships of its former flotilla rusted at their moorings.

In order to train officers and sailors for the merchant fleet and mailboats, the government continued to operate the Zinnia, a former British Royal Navy destroyer escort, under the civilian merchant marine administration.³⁵ Zinna, purchased in 1920 as a school ship and fisheries protection vessel, served Belgium until captured by the Germans in 1940. The vessel was completely rebuilt, rechristened the Barbara, and sailed under the flag of the German Navy until it was recaptured by the British in 1945. The Barbara was then given to the Royal Navy Section Belge, the precursor of today's Belgian Navy.³⁶

D. THE ROYAL NAVY SECTION BELGE - 1941-1945

As early as 1931 the disbandment of the Corps of Seamen and Torpedo Boats appeared to have been a mistake. Senior defense leaders, including the Director of the Mobilization Service, urged the military to seek a solution for the defense of the harbors, waterways and coast of the nation. The General Staff and Maritime Affairs Administration conducted an inventory of all available vessels which could be pressed into service to defend the nation. It was determined that approximately 30 more vessels would be required to provide a modicum of security. Although planning for coastal defense was undertaken seriously by 1934, it was not until December 1938 that a naval personnel depot was established.³⁷ In the event of mobilization personnel from the army and civilian naval organizations would comprise the coastal defense force.

Concurrently the government became conscious that if its neutrality policy was to be successful, a limited coastal defense was indispensable for watching over the coast and protecting Belgian merchant ships. Plans were made to order additional patrol boats with credits spread over the years 1940-1942. In the event, it was already too late and this was too little. Neither Belgium nor its allies were prepared for the maelstrom which engulfed them in 1940. Belgium's small coastal defense force never received the numbers of personnel required nor the

kinds of equipment necessary to participate in the era of modern warfare. Sailors had been issued Mauser rifles from 1889 which had been refurbished in 1916 to take bayonets.³⁸ The old World War One torpedo boats and wooden fishing vessels pressed into service were no match for the newer equipment and tactics of the enemy.

Despite the many heroic rescue and minesweeping efforts of the three coastal defense squadrons at Antwerp, Zeebrugge and Ostend prior to 10 May 1940, this small improvised fleet was unable to counter the modern magnetic mines laid by the enemy after that date. Assistance from allies was minimal due to the demands of protecting their own nations. After 10 May 1940 the remaining intact harbors of Belgium were rapidly blockaded and the small Belgian fleet served primarily to assist in evacuation of the wounded and refugees.³⁹ By 19 May 1940 bombing and strafing attacks on the Belgian coast were so intense that the cities had to be evacuated. The small vessels of the coastal defense force steamed along the coast in an effort to draw fire away from the evacuation craft. Finally, on 21 May the funds of the national bank were transferred to England along with some of the last refugees who were able to escape the country. The small naval force continued its rescue operations along the French coast until the allied evacuation of Dunkirk on 28 May 1940.⁴⁰

During the evacuation of Dunkirk several Belgian patrol boats distinguished themselves while attached to the Fifth

Division of the French Navy. Afterwards, the remaining units of the coastal defense force sailed to Spain where they were interned and literally fell apart due to the lack of maintenance and old age.⁴¹

Meanwhile, countless Belgians carried on the war effort in England, among them over 1500 men who eventually served in the British Royal Navy.⁴² The most prominent Belgian in the Royal Navy and true hero of the Belgian Navy was Victor Billet who had served on the Zinnia and was an officer on one of the Dover-Costende mailboats.⁴³ The mailboats had been blockaded in Southampton and many men desired to serve their nation instead of sitting out the war in the relative safety of the English countryside. Victor Billet not only wanted to serve Belgium and regain his nation's liberty, but also had a dream of seeing the establishment of a permanent Belgian Navy in his lifetime.⁴⁴ By July 1940 Billet had decided that an all-Belgian section in the Royal Navy would raise morale in his beleaguered country, substantially assist the allies in their maritime defense efforts, and effectively use the more than 1200 Belgian fishermen and 280 trawlers which had fled to England.⁴⁵

Although Billet's initial attempts to gain acceptance of his ideas met with little more than sympathetic understanding, he received significant support from the Belgian Minister of Economic Affairs in London, and eventually from the Royal Navy.⁴⁶ On 10 October 1940



Victor Billet was commissioned as a lieutenant in the Royal Navy Volunteer Reserve (RNVR) and ordered to take command of about 30 Belgian fishermen and sailors who had been recruited by the Belgian Maritime Affairs Administration in England. This Belgian section received basic training at HMS Royal Arthur, a Royal Navy training camp at Skegness, where all of the Belgian volunteers received their initial training throughout the war.⁴⁷ The first contingent of Belgian sailors completed their training on 6 December 1940 and were assigned to the HMS Lochinvar, the Royal Navy's Mine Warfare School.⁴⁸

Meanwhile, additional contingents of Belgian sailors were serving in ships of the Royal Navy throughout the fleet. Volunteers from the old coastal defense force and the merchant marine were joined by the cadets of the Belgian school ship Mercator who joined the Royal Navy en masse.⁴⁹ The enthusiasm with which the Belgian volunteers learned new skills and assimilated the Royal Navy's fighting spirit soon earned them the respect and admiration of their British counterparts.⁵⁰ This no doubt played an important part in the decision of the British Government to approve the creation of a special department within the Royal Navy which provided Belgian sailors an opportunity to fight as a national naval force. On 3 April 1941 a unique chapter was written in the annals of the Royal Navy when the Admiralty officially established the Royal Navy Section Belge.⁵¹ The dream of Lt. Billet

had been partially fulfilled. The Royal Navy Section Belge (RNSB) would play a significant role in the war at sea and would become the precursor of a permanent Belgian Navy.⁵²

The Belgian Government in exile nominated Commandant Georges Timmermans as the senior officer of the RNSB. He had served as captain of cross-channel mailboats, was a member of the Belgian maritime forces, and had distinguished himself at Dunkirk and subsequent evacuations on the French coast.⁵³ When the Belgian Navy was finally established in 1946 Timmermans served as the navy's first commodore.

On all ships manned by members of the Royal Navy Section Belge the flags of both England and Belgium were proudly flown.⁵⁴ In the beginning of 1942 two corvettes were manned by Belgians, first the Godetia (K-226), then the Buttercup (K-193). Both of these ships conducted three years of almost unbroken convoy escort operations.⁵⁵ By the end of the war the British Admiralty increased the number of ships entrusted to the RNSB. These ships were manned exclusively by Belgians and included the aforementioned corvettes, two patrol boats, and a small squadron of Motor Minesweepers (MMS) which were part of the Royal Navy Flotilla 118.⁵⁶

Despite the existence of the RNSB, Belgian officers and sailors were too numerous for the small number of vessels available for this navy in exile. Therefore

Belgians were assigned to ships on a fleet-wide basis and participated in most of the major campaigns and battles fought by the Royal Navy in the Second World War. These loyal and courageous patriots participated in all major British naval operations from the North Atlantic to the Caribbean, and from the Mediterranean and Red Sea to the Indian Ocean. They operated along the coasts of France, Belgium, England, and the Netherlands, and helped open the way for the liberation of their beloved country.⁵⁷

During the liberation of Belgium six RNSB minesweepers sailed to Ostend and swept a route to Zeebrugge, Walchern and Antwerp under enemy gunfire. The units were greeted with unbridled enthusiasm in Belgium, where the RNSB recruited over 1200 volunteers. Eventually, the entire Belgian Section was sent back to Belgium to assist in re-establishing the government in the liberated country. On 8 November 1945 the Royal Navy Section Belge was officially abolished, but the urgent requirements to clear the sea routes of wrecks and mines ensured the survival of the Belgian Section and aided in forcing the creation of a permanent Belgian Navy.⁵⁸

Furthermore, the International Organization for the Clearance of Mines in European Waters had defined national legal responsibilities for the safeguarding of sea routes. On 20 July 1945 Belgium received a sector which extended from the French border to Walchern in the Netherlands. Under the terms of the convention, signatories were required

to remove all dangers to navigation within their assigned sectors. The government conferred with the British to determine the cost of removal operations if performed by the Royal Navy. Although Belgium possessed highly trained and experienced personnel, the nation had no minesweepers to do the work. Fortunately, for the RNSB and all supporters of a navy, it was determined that the least costly and most logical solution was the creation of a permanent Belgian Navy.⁵⁹

E. THE BELGIAN NAVY

The creation of a permanent navy on 1 February 1946 represented the fulfillment of a long cherished dream and a turning point in Belgian history. The major determinant in forcing the re-establishment of a navy appears to have been the requirements of the international sea routes convention of 1945. Nonetheless, the dreams of such men as Leopold I, Leopold II, Lt. Billet and Commodore Timmermans had been realized. The importance of a naval force in Belgium was finally recognized as indispensable in executing the nation's responsibilities in domestic and international affairs.⁶⁰ The Second World War convinced the Belgian Government and the nation that a naval force could not be improvised due to the complexity of modern warfare and increased sophistication of warships. The nation had been caught poorly prepared for two world



wars, and Belgium could not afford to let that happen again. The only answer was to maintain sufficient military forces to adequately perform the peacetime and wartime functions of a coastal nation. Naturally, the expense of such forces could not be unlimited. but rather a delicate balance had to be struck in light of the nation's economic, political, and social circumstances and in combination with some form of collective security undertaken with Belgium's allies.

When World War Two ended, Belgium had little time or reason to celebrate the victory. The events of May 1940 came rushing back into the conscience of the country. The entire fabric of Belgian society was altered, many of its institutions radically changed, and the linguistic disputes increased, creating an internal conflict which lasts to this day. All of these forces, combined with charges and counter-charges of collaboration during the war, came together in the Belgian royal question which by 1950 came to dominate all the energies of the country.⁶¹ Not even the new navy was immune from the conflict as evidenced by its designation as the Zeemacht-Force Navale. Although the classical name, Royal Belgian Navy, was preferred by its supporters, it was recognized as early as 7 September 1945 that the king's refusal to go into exile with his government during the war

and emotion surrounding the resulting royal question forced the suppression of that name. Therefore the navy was simply designated as the sea power of the state.⁶²

The development of a modern navy in Belgium thus had a modest beginning, and it has never been recognized as a full partner of the army whose existence could be traced back in an unbroken line to the romanticized War of Liberation of 1830.⁶³ Moreover, the government had also decided to establish an air force which substantially reduced the funding available to the new navy. Nevertheless by July 1946 the navy was preoccupied with the establishment of its organizational structure and clearing the Belgian coast and harbors of mines and wrecks. The navy, with 77 officers and 1600 enlisted personnel, possessed a small fleet of ships which included two fisheries protection vessels, one British buoylayer, two patrol boats, several auxiliaries, and a squadron of nine minesweepers which were on loan from the Royal Navy Flotilla 118.⁶⁴

Between 1946 and 1949 the navy rapidly carried out and completed all of the requirements of the international agreement concerning sea routes. The MMS-type minesweepers which comprised the Belgian Navy Minesweeper Squadron 118 conducted extensive sweeping operations in all of the coastal, approach, and entrance channels to Belgium and the Scheldt River. The Belgian sector was cleared of all mines, wrecks, and obstructions which threatened maritime

traffic. Aids to navigation were re-established in all shipping lanes with the laying of new buoys in addition to refurbishing fixed coastal structures such as light-houses and navigational ranges. New personnel were educated and trained in the Netherlands under an agreement with the Royal Netherlands Navy. The navy rapidly increased the level of its expertise in mine warfare, diving, and explosive ordnance disposal (EOD) brought to it by the members of the Royal Navy Section Belge, the coastal defense force, and World War One veterans who had served with the French Navy.⁶⁵

In March 1949, the navy was finally recognized as a 7 branch of the Belgian Armed Forces when it was transferred from the Ministry of Communications to the Ministry of Defense.⁶⁶ This was undoubtedly a result of the negotiations being conducted to form the North Atlantic Treaty Organization which would require each nation to shoulder the responsibility of its own sea approaches and entrance channels to harbors and to participate equitably in the common defense of Western Europe. On 4 April 1949 Belgium signed the North Atlantic Treaty, which virtually assured the survival of the navy.⁶⁷

The outbreak of the Korean War in 1950 provided the stimulus necessary to allow the navy to expand. The first naval training center at Brugge was established with naval instructors from the Belgian, French, and Royal Netherlands Navies. A troopship, the Kamina, was

commissioned and used to carry Belgian volunteers to Korea. Under the American Military Defense Assistance Program (MDAP) Belgium built up a large mine countermeasures fleet which possessed the most modern equipment available.⁶⁸

The fifties turned out to be very active years for the Belgian Navy. The requirements of NATO membership, the Korean War, and growing unrest in the Belgian Congo combined to stretch the navy to its limit, but greatly expanded the experience and training levels of its personnel. Several naval bases were maintained in the Lower Congo which were eventually brought together under the Maritime Command of the Lower Congo in 1953. This small naval command of eight ships and three bases provided maritime direction and coordination in an area over seventy times that of Belgium. After the independence of the Congo in 1960, Belgian ships patrolled the streams and coast and assisted in the evacuation of many Belgian nationals. By the end of 1960 the Congo naval command was abolished and Belgium closed its last naval base there in 1961. The age of empire had ended for Belgium and a new era of economic cooperation with the Congo had begun. The small Congo fleet returned home, and the navy began a new era of increased participation in NATO activities which continues to this day.⁶⁹

During the fifties the navy also worked tirelessly to ensure that it was capable of executing its major peacetime and wartime missions. The results, although not always spectacular, provided Belgium with a significant

naval capability. The navy was able to ensure the safety of its waters from the mine threat, and it mounted a limited anti-submarine defense. Throughout its short history the Belgian Navy has stressed Anti-Submarine Warfare (ASW) and Mine Countermeasures (MCM) as its primary warfare objectives. The navy has attempted to emphasize those missions which could be accomplished within the limits of the assets provided by the government. Today the Belgian Navy remains dedicated to the same naval warfare objectives and is a leader in the area of mine warfare. In many respects the Belgian Navy has now advanced into its second generation. The first was characterized by a predominant mine warfare orientation, while the second generation is oriented more equally to anti-submarine warfare and mine warfare.⁷⁰.

In contrast to the early years of the Royal Belgian Navy or the Corps of Seamen and Torpedo Boats, today's Belgian Navy is much more powerful and in no way comparable to its ancestors. However, the navy of today possesses that same determination to protect the nation and its merchant fleet and proudly to show the flag of Belgium. The navy is still small and must fight for its share in the national defense of Belgium, but it is permanent and no longer required to fight for its existence.

III. NAVAL MISSIONS AND OPERATIONS

A. OVERVIEW

Belgium is situated south of the Rhine-Meuse Delta, occupying most of the Scheldt Basin, although the mouth of the river is in Holland; and the middle Meuse Basin is inside its borders. Belgium is a buffer state, lying at the western end of the Germanic world, and to the south in contact with the Latin civilization of France. It has been an age-long area of conflict between the two cultures, and its numerous battlefields have earned for it the title of the "Cockpit of Europe."⁷¹

No point in Western Europe is more than 400 miles from the sea, a factor of great significance where climate and transport are concerned. Belgium occupies the central position on the coast of the North Sea and is appropriately referred to as the strategic cross-roads of Europe.⁷²

The Belgian coast (or Maritime Flanders) consists of a broad sandy beach backed by a line of dunes which have been strengthened against the sea. The coast is straight and unbroken throughout its length of just under 42 miles, except for the canal exits at Nieuwpoort, Ostend, and Zeebrugge, (See MAP 1, p. 109).

Sea communications play a dominant role in the affairs of Belgium's economy and defense. Since the nation is

located in the delta area of the three great rivers of Europe, the Scheldt, Meuse, and Rhine, Belgium has built extensive canal systems covering more than 1,270 miles of navigable waterways, of which 950 miles are regularly used. All navigable canals are interconnected and provide access to each of these rivers. Including the Ship and Albert Canals, a total of about 200 miles of the rivers can accommodate vessels up to 2,000 tons, another 125 miles can handle 1,350 ton vessels; and nearly 225 more miles can take vessels up to 600 tons. The remainder can take 300 ton barges, mostly self-propelled, the minimum official standard of navigability. The canals from Gent to Terneuzen and from Brugge to Zeebrugge are termed Ship Canals and, in effect, make seaports out of their inland terminals. Minimum draft enroute to Gent is 29 feet; to Brugge it is 26 feet. The canal linking Brussels with the Rupel and Scheldt Rivers, and thus with Antwerp, has a minimum width of 82 feet and a minimum depth of 19 feet.⁷³

The Albert Canal across the Kempenland connecting the Scheldt at Antwerp and the Meuse north of Liege is also a high capacity waterway. It is 335 feet wide, 18 feet deep, and its locks were recently widened to 78 feet by 656 feet.⁷⁴ In conjunction with these canals, Belgium has the densest railway system in the world with over 2,590 miles of roadbed and 7,375 miles of track. Thus transportation through Belgium provides the primary avenue of

access to the sea for many European nations. Quite significantly, despite the size and efficiency of the railway network, waterborne transport of cargo remains the primary mode and usually the most cost effective.

Although the Belgian coast is extremely small in comparison with that of most maritime nations, it is situated at the most important point of the North Sea, only fifty miles from the United Kingdom, and in the area of greatest population density in the world. The Belgian coast is one of the most heavily travelled sea routes any where with over 300 ships per day of greater than 1,000 tons transiting close before the coast.

Two of the world's three busiest ports are Rotterdam-Europoort and Antwerp, numbers one and three respectively. Although Antwerp lies 50 miles up the Scheldt River, it has achieved its stature due to its waterway connections to the interior and the importance of Belgium as a commercial and industrial nation. Antwerp, with its 25 docks and over 30 miles of quays, handles an average of 175 major cargo ships per day.⁷⁵

The Belgian economy is heavily dependent upon exports and leads all other nations in the per capita value of foreign trade. The small domestic market makes the export of manufactured goods imperative as the country has no natural resources other than its agricultural produce, minerals for building materials and glass production, and coal deposits which are difficult to exploit and inadequate

for domestic needs. Thus, almost all the raw materials used in manufacturing and much of the fuel needed by industry must be imported. In order to pay for her imports Belgium must export approximately 50 percent of her total production. Although percentages are difficult to calculate, between 1960 and 1971 maritime trade transport tonnage more than doubled while the value more than tripled.⁷⁶

Maritime traffic remains a fundamental element of the industrial society. It also constitutes the most vulnerable part and the easiest element by which to neutralize a nation's economic system. A recent Organization for Economic Co-operation and Development (OECD) study indicates that at least 25% of the EEC's, 60% of the United Kingdom's, and 58% of France's exports travels in ocean going shipping, and that does not include barge, river, cross-Channel, and cross-North Sea traffic. Furthermore, Europe imports, by sea, more than 56% of its total energy needs. Moreover, the OECD study indicates that the shipping demand for all categories of cargo continues to grow at a substantial rate.⁷⁷

Belgium's growing dependence upon its maritime trade is clearly evident in the growth of its merchant fleet as indicated below:

The Belgian Merchant Fleet⁷⁸

<u>Year</u>	<u>Ships</u>	<u>GRT</u>	<u>Year</u>	<u>Ships</u>	<u>GRT</u>
1910 -	159	295,913	1950 -	222	481,207
1920 -	208	410,423	1960 -	206	728,981
1930 -	238	546,002	1970 -	230	1,062,152
1939 -	200	408,418	1977 -	271	1,595,489

Additionally, it is quite significant that although ships are not replaced one for one as old vessels are retired, the aggregate tonnage has increased. This is because new ships tend to be larger, more costly, and from a defense position, more vulnerable. It is also significant to note that half of Belgium's merchant fleet is less than five years old, and another 25% less than 10 years old, indicating a fairly recent trend toward increasing and improving the country's small but highly capable merchant service.

Alain Enthoven, while reviewing the defense forces of Western Europe posed the question, "(w)hat military-economic sense is there in countries with small forces maintaining some of each kind of force - for the Belgians to have a 4,200 man navy...?"⁷⁹ One must immediately point out that Belgium is a sovereign, independent state with national goals and objectives, and it cannot abdicate its national interest, nor can it depend upon its neighbors to execute maritime control responsibilities on its behalf. Whether or not a small Belgian Navy makes economic or military sense is an academic question, as in reality, Belgium



not only needs a navy, but it also needs to enlarge that navy to successfully carry out the missions which are dictated by its political, economic, and geographic position. Additionally, Belgium, as a maritime nation, might well consider doubling the size of the navy at the expense of its other services since the missions of the navy are cost effective when viewed in the light of services rendered to the nation and benefits gained during peacetime.

B. BELGIAN DEFENSE POLICY

The Defense Policy of Belgium is not well known since it is hardly ever a subject of debate, as the defense policies of the larger nations of the Atlantic Alliance. Furthermore, it is normally assumed, with considerable validity, that small nations are unable to execute independent defense policies and must therefore pass the policy initiative to their larger allies. This does not imply an abdication of responsibility for national defense, but rather a realization that a small nation can no longer assert that it is in such a position to insure its own defense. However, at the same time Belgium must insure that its vital national interests are safeguarded. Consequently, collective security has become the touchstone of Belgian defense policy. This is especially true as Belgium's economic and geographic situations have caused a convergence of national interests with Belgium's

neighbors and a recognition of a basic underlying dependence of the states of Western Europe, and especially of Belgium's dependence on its surrounding countries. With them it shares the primary aim or objective of national defense: the maintenance of peace, both regional and worldwide.⁸⁰

Deterrence through alliance has become the byword of Belgium's defense policy. The constraints upon Belgium's contribution to the alliance spring from inevitable economic, financial, and demographic limits. A concerted effort has been made to insure the stability of Belgium's contribution to the alliance at levels consistent with the requests of its allies while avoiding undue burden on the nation, and the fluctuations springing from domestic politics. Public opinion has seldom had a great impact on Belgian policies with NATO. The sizeable official public information effort has assisted in reducing opposition to Belgian support of the alliance, but has scarcely generated great enthusiasm for increased participation. Should the individual citizen see benefits in new civil programs, at the expense of military expenditures, then this situation could change.⁸¹

C. NATO COMMITMENTS

In general, Belgium strives to enhance detente and international stability by fully participating in NATO. Belgian military forces are totally integrated with NATO



throughout the alliance area in order to increase efficiency of operations, tactics, strategy, and overall cooperation. Belgium and her Benelux neighbors are among the most faithful supporters of NATO due to a realistic appraisal of their military capabilities and their security needs. As small nations they have suffered the trials of two major wars with their death, destruction and dislocation, in part because they stood against the aggressor individually rather than as members of an international force.

Thus, Belgium has pledged herself, under Article 5 of the NATO Treaty, to fight beside her allies if any one of them is attacked. This certainty of response is one of Belgium's primary means of enhancing deterrence. A second means of enhancing deterrence has been Belgium's designation of her entire armed forces - army, navy, and air force, - to NATO integrated commands when requested. This reflects Belgium's desire that each nation deliver to the alliance troops and support to create a more efficient European military organization and thereby strengthen the overall alliance.⁸²

The Belgian Navy is integrated into the NATO allied structure through the organization of the Commander-in-Chief Channel (CINCHAN), a permanent allied command responsible for the protection of the entire English Channel area. Reporting directly to CINCHAN is the sub-area commander, Commander Belgium-Netherlands Channel Sub-Area (COMBENECHAN) who is the Admiral Netherlands Home

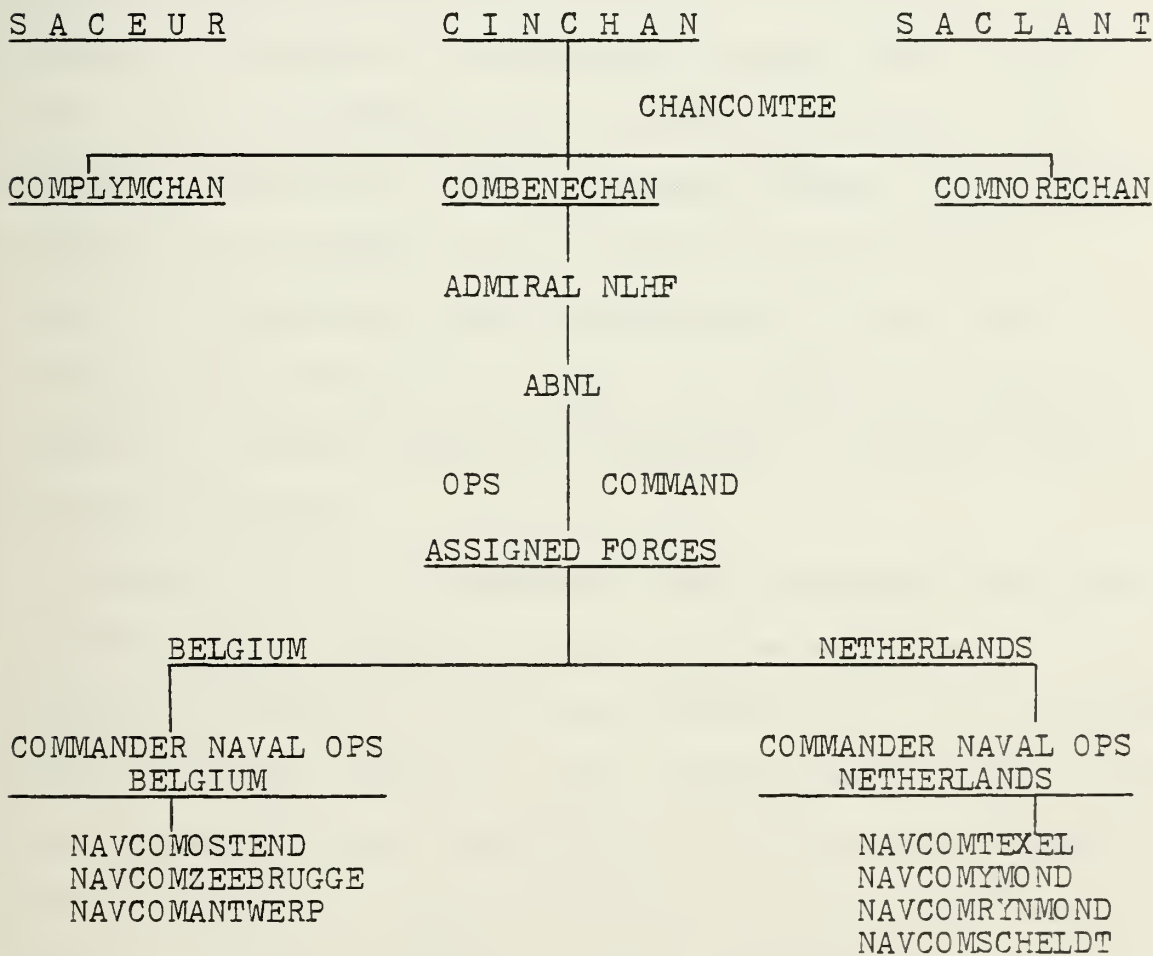
Fleet. COMBENECHAN exercises operational control over the forces assigned to him to conduct maritime operations in the BENECHAN Sub-Area which comprises a large portion of the southern part of the North Sea. The fully integrated Belgium-Netherlands staff of COMBENECHAN is headquartered in Den Helder, Netherlands. The Commander Naval Operations, Belgian Navy, COMOPSNV, serves as the Chief of Staff to COMBENECHAN when that organization is activated by CINCHAN. It is significant to note that all units of the Belgian Navy are earmarked for assignment to the defense of Allied Command Channel (ACCHAN) under CINCHAN, however, the majority of naval vessels would be directly assigned to COMBENECHAN to conduct MCM operations along the approach, coastal, and entrance channels to Belgian and Netherlands' ports.

The Admiral Netherlands Home Fleet (COMBENECHAN) is also the Admiral BENELUX (ABNL) who is the Coastal Commander for Belgium and the Netherlands when the BENELUX defense organization is activated. This coastal command was organized to execute national tasks in coastal and contiguous waters of Belgium and the Netherlands in a well organized and coordinated manner to ensure the proper distribution of forces for maximum effectiveness of available assets of the two nations. Figure 1 shows the relationship between the NATO and BENELUX commands.

Belgium's NATO naval mission is the protection of sea lines of communication in the English Channel and the

FIGURE 1

RELATIONSHIP BETWEEN NATO AND BENELUX COMMANDS



Abbreviations:

SACEUR - Supreme Allied Commander Europe
 CINCHAN - Naval Commander in Chief Channel
 SACLANT - Supreme Allied Commander Atlantic
 CHANCOMTEE - Channel Committee
 COMPLYMCHAN - Commander Plymouth Sub-Area Channel
 COMBENECHAN - Commander Benelux Sub-Area Channel
 COMNORECHAN - Commander Northeast Sub-Area Channel

ADMIRAL NLHF - Admiral Netherlands Home Fleet
 ABNL - Admiral BENELUX
 NAVCOM - Naval Command

SOURCE: North Atlantic Treaty Organization: Facts about NATO, (Paris: NATO, 1959), Chapter A4.

southern part of the North Sea. The shallow coastal and entrance channels to Belgian harbors are excellent for the execution of mine warfare, and the approach routes to the English Channel and certain parts of the North Sea are extremely vulnerable to submarine attacks. Thus, three major types of operations are required to carry out this mission successfully - anti-submarine warfare, mine countermeasures, and defense of the coastal and contiguous waters. The NATO and national aspects of these tasks converge and overlap with respect to coastal and entrance channels to Belgian ports and eventually to those of her alliance partners.

Belgian defense of merchant vessels against submarine attacks is to be handled by new frigates which were expressly designed for NATO participation and the accomplishment of national missions. The new frigates are well suited for the detection and destruction of hostile submarines and escort duty in the English Channel, North Sea, and Eastern Atlantic. The Belgian Navy plans to assign one frigate to the Standing Naval Forces Atlantic (STANAVFORLANT) on a rotational basis beginning in 1980.⁸³ They will also be available for national missions such as coastal surveillance and interdiction, training, and contingency operations.

Mine countermeasures have played a significant role in world wars and are the concern of most of the NATO member-nations. The NATO Standing Naval Forces Channel (STANAVFORCHAN) is an allied MCM squadron tasked with the

protection of the English Channel and the North Sea. The squadron is normally composed of from seven to nine MCM-type vessels whose peacetime task is to exercise constantly in NATO and national MCM exercises. Although all NATO countries are welcome to participate, STANAVFORCHAN usually consists of minehunters from Great Britain, minesweepers from West Germany and the Netherlands, and one unit from Belgium which she alternates between minehunters and minesweepers. Each ship must be assigned for a minimum of six months, however, most nations provide units for an entire year. Units assigned to STANAVFORCHAN are formally "chopped" from national controlling authorities and rely upon their national organizations only for administrative and supply support. The command of the squadron is rotated between all nations except West Germany and Denmark, the former for political reasons and the latter since Denmark does not participate on a permanent basis.

The training, cooperation and coordination of the forces of STANAVFORCHAN has achieved truly outstanding levels of combat readiness. The twelve months together provide each navy with a better understanding of its allies, an appreciably enhanced professionalism in MCM, tactics, allied procedures, and especially a high degree of proficiency with allied communications, radio-telephone procedures and the allied signal publications. Additionally, since STANAVFORCHAN has no permanent homeport, many

excellent harbors are visited throughout the northern European area which provides this NATO squadron an excellent opportunity to play the role of Ambassador-at-Large.⁸⁴

D. NATIONAL MISSIONS

Although it is often difficult to evaluate the relative importance of one mission versus another, the following primary and secondary mission areas of the Belgian Navy have been identified and prioritized in descending order by this writer:

1. Primary Mission Areas

- a. Protection of Belgium's Sea Lines of Communication and Assistance to the Merchant Fleet
- b. Coastal Security and Sanitation of Vital Sealanes
- c. Coastal Surveillance and Interdiction
- d. Fisheries Protection and Control
- e. River Surveillance and Control

2. Secondary Mission Areas

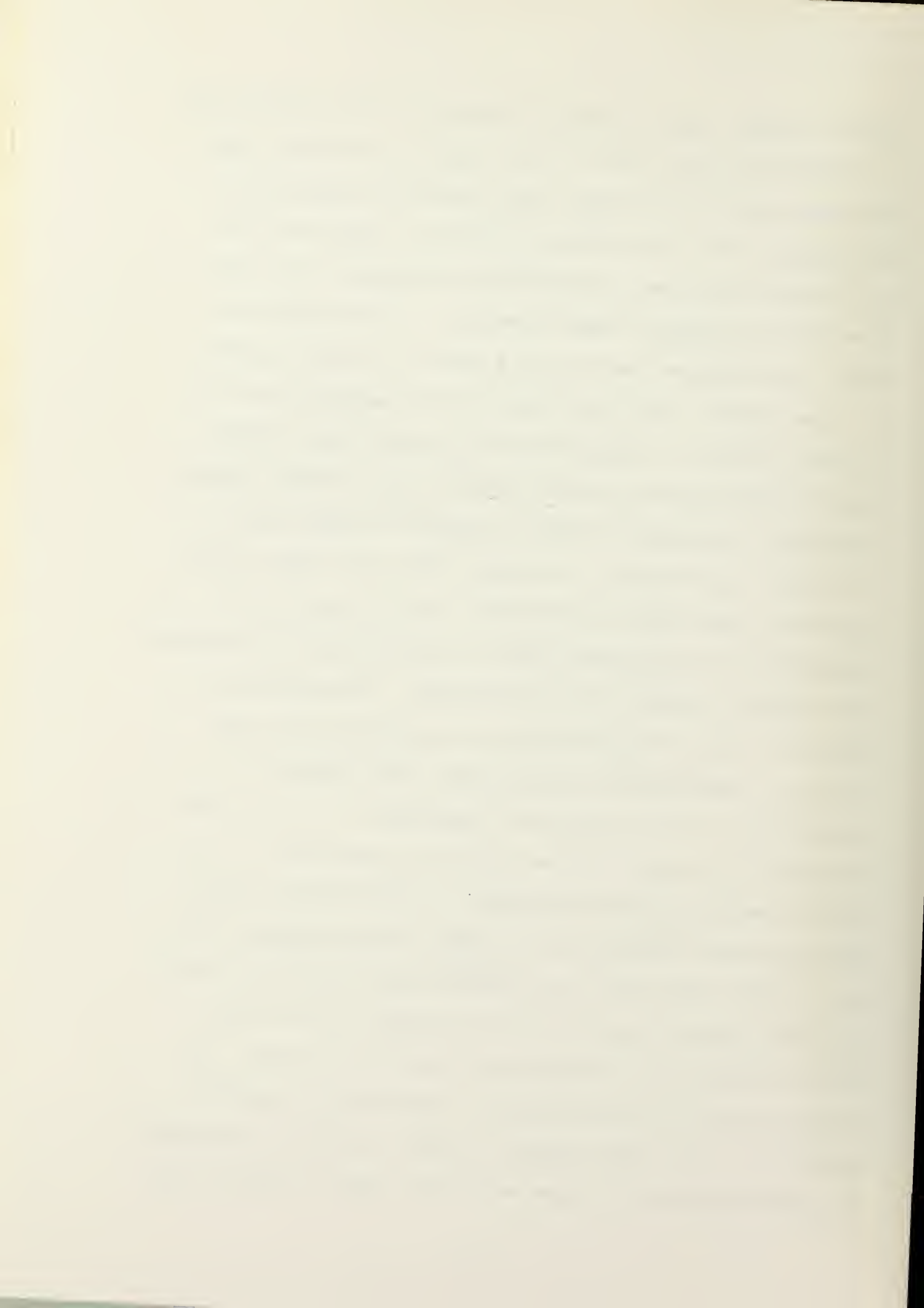
- a. Search and Rescue
- b. Explosive Ordnance Clearance and Demolition
- c. Sea Control
- d. Intelligence Collection
- e. Oceanographic Research and Data Collection
- f. Show the Flag and Goodwill Cruises

1. Primary Mission Areas

- a. Protection of Belgium's Sea Lines of Communication and Assistance to the Merchant Fleet

The missions of the Belgian Navy are, to a greater or lesser degree, similar to most other nations'

navies, though scant thought is given to using naval force to achieve political ends. This does not, however, imply that some national political ends cannot be realized by the Belgian Navy, but rather it points to the fact that only large navies can successfully accomplish the offensive sides of many of these missions. In true Mahanian style, the Belgians perceive the sea as a 'giant highway' or 'wide common' which provides nations having access to it with a means of transport that is easier and cheaper than any which exists across land.⁸⁵ Like Britain during the period discussed by Mahan, Belgium's primary aim is to protect her commerce, to ensure that the trade routes across the seas remain available. Due to the size and composition of the Belgian Navy it is not able to accomplish this mission without allied assistance. Nevertheless, Belgium is ready to participate in protecting her sea lines of communication and merchant fleet within the constraints of her economy and demography. The four new frigates will again provide her with a semblance of the type of naval platforms necessary to adequately conduct ASW and escort operations. However, "four frigates doth not a naval power make" and Belgium must continue to rely upon her allies to protect her interests, both in the waters contiguous to Belgium and around the world. The offensive side of this mission - sea denial - has been passed on to her more capable allies, but she is preparing to participate even in the sea denial role as part of the



Standing Naval Forces Atlantic in 1980. In simplistic terms the defensive side of protecting Belgium's SLOCs may be thought of as sea control, in that the object is to temporarily maintain control over a limited area in order to protect the merchant fleet of the nation and other nations' vessels enroute to or departing from Belgian ports.⁸⁶ Caution must be used in this terminology as sea control and sea denial are not necessarily opposites. Preventing the enemy from using the sea is implicit in the idea of sea control while they share many similar tactical objectives.

The purely defensive side of this mission area consists of the physical protection of the merchant vessels be it from air, surface, or sub-surface attacks. Included herein are mine countermeasures to ensure that vital approaches, coastal routes, and entrance channels are kept free of sea mines which pose an especially dangerous threat to maritime traffic in the Channel-Southern North Sea area.

The Belgian Navy provides training for merchant marine deck officers and cooperates fully with COMIXMAR (Committee for Maritime Traffic) which is a Belgian civil organization similar to NATO's Naval Control of Shipping Organization (NCSO). The purpose of this committee is to control and direct the movements of all merchant vessels to prevent accidents in peacetime and to preclude enemy attack during a conflict period. The importance

and seriousness of this committee is reflected by the fact that the Chief of the Naval Staff, the Chief of the Army (or his personal representative), and the Director General of Maritime Affairs serve on it.⁸⁷ The navy has also instituted the BELMAR Program whereby Belgian merchantmen utilize a communications system using navy channels.⁸⁸ Thus, the merchant fleet can be kept in direct contact with appropriate naval forces when the system is activated.

Additional services to the merchant fleet during peacetime are provided by the three coast radar stations and Scheldt Radar System during periods of inclement weather. This system could also be utilized to direct vessels around known mine danger areas and obstructions such as wrecks during a wartime period, assuming vessels were otherwise able to transit through the area.

b. Coastal Security and Santiation of Vital Sealanes

The North Sea covers an area of 164,000 square miles to an average depth of 308 feet. It is not only one of the world's five smallest major bodies of water, but is also one of the three shallowest bodies of water which are also principal maritime routes.⁸⁹ The coastal routes and approach routes in the Southern North Sea are the best suited for minelaying of all maritime areas in the world. The water depths seldom exceed 30 to 40 meters (about 100 to 130 feet) and it is in these shallow waters where shipping dominates. Consequently, mine

warfare and mine countermeasures are of principal concern to the Belgian Navy in the protection of seaborne commerce as emphasized by two German naval officers in their recent article entitled, "Shallow Water Warfare in Northern Europe," when they said,

(f)or the main types of mines a water depth of at least 6 meters (about 20 feet) may be presumed as the lower employment limit. Moored mines within the coastal waters of the European area are bound to a maximum depth. Bottom mines may be employed in water depths up to about 60 meters (about 200 feet). Thus, all normal main shipping routes in the North Sea meet all the requirements for mine warfare, so that all types of mines must be expected in these waters. The routes which are being used are generally the shortest connections along the coast and, therefore, they have very shallow water, and are the focal points of shipping. For this reason they are especially suitable for minelaying.⁹⁰

Therefore, the Belgian Mine Warfare Flotilla must be ready not only to detect the presence of sea mines, but also be capable of neutralizing them to prevent an interrupted flow of maritime traffic. Depending upon the scope of possible enemy mining activity, diversion routes might also be required within the constraints of water depths and the drafts of merchant vessels. At the extreme, it may be necessary to guide convoys through known minefields or around sunken vessels in order to continue the delivery of essential war materials. Naturally, this scenario could also include protection from hostile air and surface attacks which would only serve to further complicate an already dangerous operation.

An additional task within the scope of the mine warfare forces is the establishment of totally new sea routes in time of war. This would require MCM search operations to ensure that the areas involved were free of mines, and the planting of buoys for navigation.

c. Coastal Surveillance and Interdiction

The peacetime surveillance and interdiction role has undergone a tremendous increase in activity in recent years. The navy cooperates frequently with the Ministry of Justice to assist in the suppression of smuggling in Belgium's territorial waters. During the past several years coordination between INTERPOL and the national authorities has resulted in the successful interdiction and arrest of narcotics smugglers in Belgian and Netherlands' waters.⁹¹

Since Belgium does not have a separate coast guard, all of the functions assigned to that service in the United States fall under the province of the Belgian Navy. Consequently, the navy cooperates with customs officials, the maritime police, and state police in all matters concerning maritime affairs.

During wartime the navy is responsible for the detection and destruction of hostile shipping. Due to the size of the Belgian Navy this wartime task would be executed in cooperation with NATO and would probably be conducted at the approaches to the English Channel, the Baltic, and the North Sea.

d. Fisheries Protection and Control

Existing international agreements provide that each maritime state is responsible for its territorial waters and has exclusive supervision over fishing and other marine resources within them. Each nation is charged with the responsibility to conduct fisheries protection and control over its own fishing fleet as well as the fleets of other nations who are signatories to the following conventions:⁹²

London Convention - 5 April 1946 - on size of nets and fishcatches in the Atlantic and Arctic Oceans.

Geneva Convention - 28 April 1958 - on conservation of biological resources of the high seas.

London Convention - 9 March 1964 - on fishing rights in Western European waters.

London Convention - 1 June 1967 - on fishing in North Atlantic waters (replaced the Hague Convention of 1881).

Rome Convention - 23 October 1969 - on conservation of biological resources in the South Eastern Atlantic Ocean.

Copenhagen Arrangement - 18 December 1973 - on fishing in waters surrounding the Faroe Islands.

The Belgian fishing fleet is small, consisting of 231 vessels, 91 of which are over 100 gross registered

tons.⁹³ The fishing industry, a slowly declining sector of the economy, employs only 2,200 men, many of whom are foreigners. The primary reason for this decline is the lack of investment in modern equipment because fishing is not looked upon as an attractive way of earning one's livelihood in Belgium.⁹⁴

Despite the fact that the fishing industry is declining, Belgium must continue to conduct periodic patrols in the areas frequented by her fishermen. Fisheries protection cruises are carried out in the North and Irish Seas under the auspices of the Ministry of Agriculture to provide medical and technical assistance, control over fish size and catch limits, and to ensure territorial restrictions are not being violated.

All of the coastal states of the Northeast Atlantic Ocean except Norway and Iceland have a 12-mile Exclusive Fishery Zone. The London Convention of 9 March 1964 established a special fishing zone in the outer six miles of the 12-mile zone wherein nations which have habitually fished in the outer zone between 1953 and 1963 could not be denied the opportunity to continue to use those waters. Each coastal state was granted the right to regulate the fish catch within its outer zone, but could not substantially alter the nature and fishing operations of guest nations.⁹⁵ Additionally, the 20 October 1970 EEC Fishing Agreement requires each member to ensure equal conditions of access to waters subject to their jurisdiction

for all fishing vessels flying the flag of an EEC member state and registered in the community. However, the treaty of accession of Great Britain, Denmark, and Ireland effectively suspended this agreement until 31 December 1982 by authorizing each EEC state to restrict access to fishing areas within six miles of the coast to vessels that have traditionally fished there and which operate from a nearby port. Thus, by 1983 all of Belgium's waters will be open to all fishing vessels from EEC member nations.⁹⁶

e. River Surveillance and Control

The navy is also tasked with the responsibility to assist in maritime control on the Scheldt and Meuse Rivers. Naval units are primarily engaged in surveillance operations on the Scheldt River where they render assistance as requested by merchant vessels or Belgian customs agents. Additionally, the river radar system provides safe navigation to transiting vessels during periods of low visibility. Fog is a particularly serious problem throughout the Northern European area making such a system mandatory. River patrol boats located at Kallo under the direction of the Naval Command Antwerp are available on a 24-hour basis as required.⁹⁷

2. Secondary Mission Areas

a. Search and Rescue

Aid to mariners in distress is a most important and highly appreciated aspect of the navy's service to the nation and to foreign seamen requiring assistance. For this purpose three inshore minesweepers act as Ready Duty Ships (RDS) and take turns as rescue and assistance ships 24-hours a day, seven days a week. In addition, the navy and the air force maintain at least one helicopter on 24-hour alert at the Belgian Air Force Base in Koksijde. Thus, the armed forces are ready to render technical and medical assistance at a moment's notice within the entire area of Belgian territorial waters, coasts, and harbors. Such assistance includes towing, fire fighting, medical evacuation, explosive ordnance disposal (EOD), and treatment of divers at the navy's fully equipped decompression facilities in Ostend.⁹⁸

b. Explosive Ordnance Clearance and Demotition

Although the Clearance-Divers Section of the Belgian Navy consists of only seven officer and about 66 enlisted personnel, it is responsible not only for the disposal of all explosives at sea and ashore (including EOD services to all ships berthed in Belgian harbors), but also for the instruction and training of all divers in the navy and the other services.⁹⁹ Personnel are divided into three groups: the Operational Underwater Explosive

Team, the Operational Landmine Team, and the Instruction Team which trains the EOD crews for all the services and the Belgian State Police.

The importance and contribution of these EOD teams cannot be overstated because an inestimable quantity of explosives are still scattered throughout Belgium and her territorial sea. Invariably, explosive devices are discovered during MCM exercises, during excavation operations for new building, and along the beaches after major storms. Additionally, as the field of mine warfare continues to stress minehunting over minesweeping, diving operations will continue to grow in importance since that is the primary method of neutralizing sea mines in the absence of the French PAP system.¹⁰⁰

. c. Sea Control

As mentioned above with respect to protection of Belgium's sea lines of communication, the Belgian Navy has only limited assets available to execute the type of operations included under the rubric of sea control. In a generic sense, sea control as a naval strategy must be considered a secondary mission due to the small size and composition of the Belgian Navy. In wartime Belgium would be hard pressed to protect merchant vessels and maintain safe sealanes within the immediate vicinity of her coasts, assuming vessels managed to reach the Belgian coast. The navy would not be able to conduct operations in the open oceans and still provide protection to its own coast

except in cooperation with her allies. Once again, due to the small size of her fighting fleet, Belgium would only be able to provide a small contribution. However, that contribution, no matter how small, would add to the forces of the allied effort and must not be considered insignificant.

Consequently, Belgium, like her neighbor West Germany, must be classified as having a coastal defense strategy as both are unable to "command the sea." This does not, however, mean that Belgium's forces are impotent. As Admiral Stansfield Turner has put it, the new term 'sea control' is intended to connote "more realistic control in limited areas and for limited periods of time."¹⁰¹ Additionally, this new conception of sea control evolved due to the limits on ocean control brought about by the development of the submarine and airplane. Many naval strategists doubt whether even the larger navies are capable of successfully executing sea control missions except under heavily qualified conditions, and then for only limited periods of time.¹⁰² In this field, Belgium would concentrate upon sea control objectives within her immediate coastal vicinity and as assigned by NATO authorities while relying upon her allies for sea control within the larger sphere of the Atlantic Ocean and North Sea.

d. Intelligence Collection

As one would expect, the Belgian Navy has played only a small role in the intelligence collection, analysis, and distribution mission. Collection of intelligence has been primarily on an "opportunity" basis and invariably in close cooperation with NATO under the aegis of the Commander-in-Chief Eastern Atlantic Area located at Northwood, United Kingdom.¹⁰³ Belgium relies heavily upon the NATO Intelligence Organization for 'real-time' intelligence which is normally passed via national channels. Intelligence reporting is normally done via national channels to the NATO Surveillance Coordination Centers unless it is "time-critical." Then it is passed directly to the nearest NATO command with which communications can be established.

Intelligence operations will undoubtedly increase in scope, intensity, and importance as the new Belgian frigates are fully integrated into the fleet. The anti-air, anti-surface, and anti-submarine roles of the frigates will require, as well as provide, a step-level increase in intelligence information in order to be ready to counter a potential enemy. To that end the frigates will be integrated into squadrons of the Royal Netherlands Navy for intensive training in all areas of naval warfare.¹⁰⁴

e. Oceanographic Research and Data Collection

Although there is only one Belgian oceanographic research ship (a former coastal minesweeper), many naval vessels have executed oceanographic operations in the coastal region of Belgium to determine the biological environment of the North Sea. The Mathematical Model of the North Sea Project conducted in cooperation with other North Sea nations is an attempt to discover the patterns and characteristics of the changes in the North Sea due to pollution by heavy metals, chemicals, and oil. The Belgian effort in cooperation with the Naval Research and Development Division in Ostend consists of more than 200 researchers from laboratories, universities, and research institutes of various government ministries.¹⁰⁵

Additional pollution control and testing programs are conducted by the navy and the Belgian Federation of Petroleum Producers to develop, test, and evaluate new methods of pollution control along the coast and in the river Scheldt.¹⁰⁶ In 1971 Belgium became the pilot nation in the investigation of oil spills under the auspices of NATO. The navy currently maintains approximately 15 minesweeper-sized vessels which can be equipped with anti-pollution material on a very short notice. Belgium's location and vast experience in shipping makes her ideally suited to lead this important program.¹⁰⁷

Scientific research in oceanography and physics is also conducted in cooperation with the NATO MILOC

Organization, civilian universities, and various European Economic Community (EEC) agencies. Data Collection on currents, bottom contours, and mine burial are continuing projects of great importance with respect to MCM operations. In cooperation with the Belgian-Netherlands Mine Warfare School several excellent local area charts have been produced to enhance the minehunting effort of the operating forces.¹⁰⁸

f. Show the Flag and Goodwill Cruises

Although this mission is treated last, it cannot be considered the least important. Indeed, for a small nation this mission could be most important and fruitful if properly planned and executed. The concept of trade following the flag is an ancient one of considerable importance to a nation such as Belgium. As indicated above, Belgium must export approximately 50 percent of her production to pay for its imports. New markets are always a welcome addition to a nation's economy, and a nation such as Belgium may be able to establish relations and eventually markets with nations that might be hesitant to deal with a larger western power. Additionally, the new frigates are the first major warships produced by Belgian shipbuilders who would surely welcome orders for them from foreign nations. With this in mind, the new frigates will begin making goodwill cruises in 1979 in cooperation with the Ministry of Defense and the Ministry of Foreign Trade under the aegis of the Belgian Ministry of Foreign Affairs.

Although general trade remains extremely important, Belgium would profit greatly from an expanded ship-building industry.¹⁰⁹

Second, the political effect of goodwill cruises to nonaligned countries by small nations of the western alliance is increasingly important. Small nations are often viewed as rather harmless and not imperialistic. Consequently they pose no perceived threat to nonaligned or non-western nations. Nonetheless, a warship "is a parcel of national sovereignty. ...a sort of floating embassy."¹¹⁰ It represents its nation and can carry with it the western philosophy and culture in foreign ports where ships of larger nations may not be welcome. At the same time, by acting as a sort of 'ambassador-at-large,' a visiting ship of a small nation still reflects the concern for the host nation by the countries of the west. For example, during the 1976 goodwill cruise of the Belgian Navy, the Zinnia (A-961) visited ports in Algeria, Tunisia, Sicily, Greece, Turkey, Egypt, and Saudi Arabia. Needless to say, friendly relations were not the only reasons for such a line-up. The immediate concern was probably to ensure an uninterrupted supply of oil from Saudi Arabia and a sort of acknowledgement of that country's help during the oil crisis in 1974 when Belgium's oil was allowed to continue flowing through Rotterdam. One can also speculate that a concern was being registered for the successful resolution of the Greek-Turkish conflict

by consecutive visits to Greece and Turkey. This writer assumes that the visit to Egypt was to confirm Belgium's relations with a "western oriented" Egypt and to improve commercial ties. In all of these cases Belgium acted as a sovereign state and yet its ship carried with it the realization that Belgium was in NATO and the Western camp.¹¹¹ In such cases cruises can play a significant part in the West's desire to establish and maintain good relations with nations which are either nonaligned or of a potentially hostile ideological persuasion.

E. TEMPO OF OPERATIONS

Although, with the launching of the new frigates, 1976 may be considered a major turning point of the Belgian Navy, it was in 1977 and 1978 that the tempo of operations was altered dramatically due to the enlargement of the fleet. In January 1977 the Belgian Navy roster consisted of 4,381 personnel onboard with an authorized limit of 4,486. In January 1978 the limit was reduced to 4,437 personnel with 4,409 actually onboard. Thus, the fleet has been increased by four new frigates with a peacetime personnel authorization of 140 per ship while personnel limits have been reduced. Many MCM units have experienced a reduction in crew levels to make personnel available for the initial break-in and testing periods for the frigates. In many cases the losses to the MCM flotilla represent the

most highly qualified officers and petty officers of the navy. Through a policy of "rationalization and judicious redistribution of total available resources" the navy has attempted to maintain the MCM effort unaltered.¹¹² Needless to say this has required a reduction of the number of ships in active service, which tends to exacerbate further the problem of executing all required missions. However, this problem is somewhat ameliorated by the fact that the navy has been almost exclusively MCM oriented since the decommissioning of the old Algerine Class escort-mine-sweepers in 1966-1969. Therefore, all personnel are MCM oriented and should be able to provide an adequate level of expertise despite the loss of what must be considered the most highly motivated and capable personnel to the four frigates. This problem will be alleviated to some extent after the initial trials and acceptance periods of the frigates as the navy will probably place two frigates in reserve and establish a rotation system to allow two frigates to remain in active service. The navy is well versed in the rotational-ship concept which is treated more fully in Chapter IV.

Finally, with the increased capabilities of the present ocean minesweepers equipped with the French PAP system, the navy can adequately carry out its peacetime missions with fewer ships. PAP is the French wire-guided mine disposal device equipped with a television camera. The PAP vehicle is guided via sonar to the mine-like

contact in order to visually identify the contact. If the contact is a mine, a demolition charge is released by remote control from the PAP, after which time the vehicle is recovered prior to detonation of the charge. PAP is the French abbreviation for Poisson Auto Propulse or self-propelled fish. This MCM device speeds-up the minehunting rate and allows the navy to accomplish its MCM missions with fewer ships.

It is rather ironic that Belgium has too many ships and too few people to man them. This situation is reminiscent of the mid-fifties when Belgium built up her minesweeping fleet from 8 to 45 sweepers. Eventually she was able to cut back in numbers while still maintaining an excellent MCM capability. This was primarily due to the improved technology of minehunting sonars and to combining several types of sweeping equipment on one ship.¹¹³ Similarly, the new trinational MCM vessel now in the prototype-building phase will allow a further reduction in numbers of ships required to accomplish Belgium's mine warfare missions adequately.¹¹⁴

In general, Belgian naval vessels spend almost twice as much time as those of the United States Navy at sea conducting exercises, individual ship's training, training for the Merchant Marine School students and naval cadets, public relations cruises, and fisheries protection operations to name but a few functions. Care must be taken when analyzing the at-sea time as, more often than not,



the ships are operating in the immediate vicinity of their homeports and return to port each evening. The exceptions to this routine are the flagship of the MCM flotilla and the units assigned to the Standing Naval Forces which experience an even higher tempo of operations due to their missions. For example, the MCM flagship participates in almost every MCM exercise conducted by national, allied, or NATO authorities in the North Sea-Channel-Northeast Atlantic area while only one or two of the three MCM squadrons may be taking part in any particular exercise. During this writer's assignment to the Belgian Navy, the flagship of the MCM flotilla spent over 50 percent of the time at-sea.¹¹⁵

Since the frigates are not yet integrated into the fleet and available for national operations, the majority of the missions are executed by the MCM flagship, three ocean minesweepers (MSOs), three coastal minesweepers (MSCs), and three inshore minesweepers (MSIs).¹¹⁶ One MSO is assigned to STANAVFORCHAN and is not available to the navy except in the case of a national emergency. Three additional MSIs are used almost exclusively as Ready Duty and survey ships, and one converted MSC is the navy's primary research platform. Several additional ships are manned by reserve personnel and used exclusively for training purposes. Finally, there are four MSOs, one MSC, and three MSIs in rotational-reserve undergoing maintenance, repair, or overhaul. (See Chapter III for



complete details on the Belgian fleet.) The navy does not have the quantity of personnel required to keep all ships in active service, and at the same time the navy probably does not need all the ships it possesses to successfully carry out its missions. Nevertheless, the navy could use a few of the ships in reserve to ease its burden if personnel were available. Table I is a partial summary of the scope and intensity of the operations of this small but effective force.

In conclusion, one is tempted to recall Alain Enthoven's statement and decide that it makes no sense for Belgium to have a 4,200 man navy; but rather Belgium should have a much larger naval personnel force to accomplish those missions which are associated with coastal nations that depend upon maritime trade. The navy possesses sufficient ships but lacks the personnel to man them. Furthermore, each international convention dealing with laws of the sea has reiterated the fact that each nation is responsible for insuring compliance in its territorial waters. The general adoption of the 200 mile limit currently under consideration would increase the area of Belgium's territorial waters by a factor of twelve. The navy would be hard pressed to maintain surveillance within the enlarged area and still carry out all of its other missions.

Finally, there has been increased attention directed toward the protection of energy resources and some



TABLE I

OPERATIONS OF THE BELGIAN NAVY - 1977 (except as
noted)

- nautical miles steamed: 184,319
- sea-days steamed: 2,083
- river patrol miles steamed: 10,433

NATO and Multinational Operations:

- 2 major MCM exercises
- 1 MSO with STANAVFORCHAN
- 1 NATO-wide Command Post Exercise

Training Cruises:

- 2 for students of the Merchant Marine School, Antwerp
- 2 for cadets from the Royal Military Academy, Brussels
- 2 for students of the Naval Indoctrination School, Brugge
- 3 for NAVCLEARMIN (Clearance-Divers)
- 1 MCM work-up cruise for each unit
- 1 MCM summer cruise for each unit
- 1 HDO cruise (Helicopter Direction Officer Training)
- 2 reserve personnel

Public Relations:

- 1 goodwill cruise to Africa - 2 months
- 34 public relations day cruises for 2,480 passengers
- 49 visits to foreign ports

NAVCLEARMIN (Clearance-Divers Section):

- 643 missions executed
- 34,229 Kg of explosives neutralized, 18,753 of which were exploded in the sea. This represented the largest quantity since the period 1959-1960.
- 3000 missions 1972-1977 resulting in 150 tons of explosives.

Fisheries Protection Cruises:

- 3 in North Sea and Irish Sea, 135 days total during which time 143 ships of various nationalities were examined. 25 ships required technical, logistic, and/or medical assistance.

Rescue and Assistance:

- over 200 helicopter flight hours per year involving sea rescues
- 1973-1976, 30 civilians received treatment at the Naval Decompression Center in Ostend.
- arrival and departure assistance is provided approximately 50 times per year to the Ostend-Dover ferries.

Oceanographic Research and Pollution Control:

- 1975 and 1976 over 500 missions, many of which were pollution research studies.
- Helicopters fly an average of 30 pollution control missions per year.



Special Representations:

- participation at Queen Elizabeth II's Silver Jubilee Fleet Review
- participation at the Kieler Woche
- participation at Cowesweek
- participation in 9 additional national and foreign special events or national days.

SOURCES: Witboek van Landsverdediging, "Reunion d' Information Force Navale," Operationele Richtlijnen Voor 1977, and "Een Greep uit Fredestijd." Table I is a partial compilation of the data found in each of these sources.



recognition to the possibility of making such missions more than just a national undertaking. It is not inconceivable to envision some form of multinational force to protect the resources of the North Sea either under a NATO, multilateral, or EEC agreement in the future.¹¹⁷ Should such an agreement evolve, all nations must be ready to participate. This would add yet another mission to the Belgian Navy's requirements and make it even more difficult to accomplish its responsibilities. Thus, an increase in the size of the navy would be most reasonable in peacetime and most welcome in periods of conflict.

IV. THE BELGIAN FLEET

A. OVERVIEW

As noted above, the Belgian fleet, as we know it today, traces its beginning to 3 April 1941 with the establishment of the Royal Navy Section Belge (RNSB). Thereafter, and until the end of World War Two, the RNSB sailed and fought in the ships provided by the British Admiralty. On 1 February 1946, the Belgian Navy, designated the Zeemacht-Force Navale was established under the Ministry of Communications.¹¹⁸ The navy was transferred to the Ministry of Defense and recognized as the third branch of the armed forces on 1 March 1949.

Belgium signed the North Atlantic Treaty on 4 April 1949, the treaty and subsequent NATO agreements committed the nation to maintaining and enlarging its naval forces.¹¹⁹ The first fleet acquisition program was directed toward the purchase of sufficient escort ships and mine counter-measures vessels to counter the ASW and MCM threat. By the late fifties this program provided the navy with more than 60 vessels including 8 British and Canadian Algerine Class escort minesweepers and 45 new minesweepers built either in the United States or Belgium.¹²⁰ During these early years the navy's MCM tradition became well established in the minds of its NATO allies. In fact, Belgium's MCM expertise became so well established that many people

THE

1890

THE

THE

failed to recognize that Belgium also emphasized merchant ship protection and convoying as its primary mission areas. Moreover, it was convoy operations which had earned the RNSB many plaudits during the war. The Ministry of Defense in providing the navy with its missions on 9 February 1948 had identified convoy escorting and coastal protection as the two most important mission areas.¹²¹ Consequently ASW and MCM operations were expected to receive the highest priority. In the event, MCM received virtually all the attention at the expense of the navy's ASW capability.

The Belgian MCM fleet had been established in recognition of the serious threat posed by mine warfare in the relatively shallow waters of the English Channel and North Sea. Furthermore, mine countermeasures vessels were cheap to build and maintain compared to frigates or destroyers, and the latter required a greater expenditure of men and material to operate. Thus, MCM was seen as an area of naval operations well-suited to a small navy with limited funds, manpower, and political support. Moreover, the navy would be unable to accomplish both ASW and MCM requirements within the constraints imposed upon it. Therefore, despite formal mission statements, MCM was consciously selected as the primary role of the navy until such time as it could afford to build-up its ASW capability.

The second fleet program began in the mid-sixties to provide the navy with two Belgian-Built Mine Countermeasurers



Support and Command Ships (MCSC) and the modernization of the MCM fleet. The MCM support and command ships were designed to allow the MCM fleet a greater degree of mobility by providing a full range of logistic support and major repair capability at sea and in distant locations. Additionally, the command and control facilities of the MCSC's, oriented toward the task group commander, provided for on-scene direction and coordination of operations. The fleet improvement program also provided for the installation of the latest MCM sonars and mine destruction equipment such as the French PAP system.

The navy's (supposedly) primary escort mission was not, however, forgotten. As early as 1964 the navy submitted its first ship acquisition plan to replace the then aging Algerines.¹²² Unfortunately, these plans were not accepted by the government until 1969, the same year the last escort vessel was retired from service.¹²³ Consequently, the navy lost its limited capability to protect the nation's merchant fleet and sea lines of communications.

Today the Belgian Navy is in the midst of its third and fourth fleet programs which were adopted in 1971 and 1975, respectively. The navy's new frigates comprise the third program and are the first major warships to be designed and built in Belgium.¹²⁴ Their primary role is to regain the Zeemacht's mission to protect shipping in the Western Approaches to the Atlantic and North Sea. The fourth fleet acquisition program is embodied in the Trinational



Minehunter Program with Belgium, France, and the Netherlands as joint partners. These new trinational MCM vessels are being designed to replace the aging MCM fleets of each participant as well as to provide a smaller, more capable fleet to serve each nation and NATO.

Appendix A is an overview of the Belgian naval fleet as of 1 January 1979. Although 48 vessels are listed in Appendix A, not all ships are in active service. The navy utilizes a rotational-ship or rotational-reserve system which allows it to possess the number of vessels it determines necessary to execute its wartime missions. The navy personnel authorization is too small to man all of its ships, except in an emergency. Therefore, several ships are always maintained in reserve, depending upon operational needs and the availability of personnel. Two levels of readiness exist in the reserve fleet; unmanned, ready for immediate use, and unmanned, under overhaul or major repair. This allows a great deal of flexibility in planning and ensures replacements to active fleet units which experience major casualties. Furthermore, it allows maintenance, upkeep and major repairs to be done in an efficient manner without reducing the size of the active fleet. (See Chapter V for additional information on the rotational-ship system.)

Finally, Belgium also recognizes its need for fast coastal patrol boats to assist in coastal defense and maritime police duties. Unfortunately, the lack of funds

prevents the navy from embarking on such a program in the near future.¹²⁵ Perhaps such an acquisition will constitute the fifth fleet program in conjunction with replacing the existing river patrol boats which are all over 25 years old.

B. FRIGATE SQUADRON 181

The four ships of Squadron 181 represent the most modern guided missile frigates (FGMs) in NATO Europe and a large contribution to the NATO ASW effort; an effort which has been increasingly urged by the major NATO commanders.¹²⁶ Both SACLANT and CINCHAN continually urge members to increase the quantity and quality of NATO's ASW effort in the North Sea, English Channel and Western Approaches to the Atlantic. Soviet diesel submarines, especially the Foxtrot class, are considered the greatest threat in the North Sea area because limiting depths of about 50 fathoms make it inadvisable to risk the use of nuclear subs in this area. Soviet nuclear hunter-killer submarines are believed to be the greatest danger in the English Channel-Western Approaches due to the distance from Soviet naval bases and the tremendous temptation that maritime choke point provides to interdict shipping. Submarines in these areas would be masked by the high noise density of large merchant ships and extremely difficult to detect by ASW forces, especially in view of the limited numbers of ASW vessels to patrol this 164,000



square mile area. Therefore, the modern Belgian frigates are a very welcome addition to NATO and allow the Zeemacht to execute its primary mission for the first time in over a decade.

1. Frigate Capabilities

These 28 knot frigates are outfitted with four MM 38 Exocet launchers which are the most advanced anti-shipping, surface-to-surface missiles in NATO. This 17 foot, 1,600 pound weapon carries a 330 pound shaped-charge warhead and has a range of 20.5 nautical miles at mach 0.96.¹²⁷ A single mount 100 mm dual-purpose gun firing a 13.5Kg projectile provides anti-surface and anti-air defense to ranges of 17 Km and 8 Km respectively. This gun also meets the NATO standardization requirements in being medium-calibre and has a high altitude capability of 80 degrees to supplement the ship's 8-cell NATO sea Sparrow SAM system. Consequently, the anti-air defense system is capable of providing point defense against low and medium altitude aircraft and missiles. Additional space has been reserved for the future installation of a close-in-weapons-system (CIWS) which some observers feel is necessary to provide adequate point defense.¹²⁸

The ASW suite of the new frigates consists of the Westinghouse (Canada) medium range SQS 505A sonar and two medium range torpedo launchers with L5 homing torpedoes.

A short-range Bofors sextuple 375mm anti-submarine rocket launcher complements the French Lg heavy torpedo system.¹²⁰

The new Belgian frigates, like most small combatants, cannot perform all surface naval tasks. They can, however, perform most tasks as well as larger ships when limited to their area of responsibility. For some functions these ships are obviously superior, and for other tasks within their capabilities, they are cost-effective when compared with major units employed for the same tasks. The major short-comings of these frigates appear to be the absence of helicopter landing facilities and a variable-depth sonar (VDS). Despite studies which indicate that helicopters are not fully effective on ships of less than 3,000 tons, the addition of a rocket launcher (the Bofors 375) does not appear to compensate for the loss of air capability in a multipurpose naval platform. The use of a smaller Bofors launcher and lighter torpedo system would have provided a partial solution in space and topside weight, as well as cost, which were the major considerations to eliminate the helo-deck. Moreover, since these frigates are destined to operate in STANAVFORLANT, it would have been convenient to ensure similar flight capabilities to those incorporated in most modern frigates. Although the VDS may not be necessary in some parts of the Belgian operations areas, there are many areas in the North Sea and Western Approaches where only VDS will provide adequate sonar detection. Finally, the lack of redundancy should

the single mount fail, dictates an early retrofit of the CIWS package. This is a similar problem among many navies today, as modern naval construction favors one single mount gun on almost all ships.

Presumably, costs were the primary consideration in systems selection. It is likely that the navy could not convince the decision makers to approve all their desires. Nevertheless, the Belgian frigates are very capable warships which possess a high degree of fighting capability.

2. Standardization and Cooperation

The new Belgian frigates are not only excellent ships, but also outstanding examples of what can be accomplished through international cooperation. The casual observer of maritime affairs might dismiss their significance out-of-hand due to the small number involved. That would be unfortunate as the overall program has great significance because it represents a step-level increase in the scope and breadth of standardization and cooperation between NATO allies.

The frigate program from its inception was directed toward maximum standardization with respect to its military package of weapons, sensors, communications, and associated system. Emphasis was placed on cost reduction, national design and construction, and procurement of foreign systems only if compensated by purchases in Belgium of similar equipment for equivalent value. Despite

these rather awesome constraints, the frigates are 50 percent standardized with those of the Royal Netherlands Navy and 30 percent with the French Navy.¹³⁰ Additional standardization was possible but proved difficult and too expensive due to dissimilarity in tonnage and mission characteristics of the new frigates in the three navies.

This amount of standardization was only possible with a high degree of cooperation between Belgium and its NATO allies. The decision to design and construct a new class of frigates with technical assistance from other navies was selected instead of buying an existing ship from allies or building a new ship under license. It was determined that the risks of own-design and construction provided maximum economic returns, was good for the country's industrial technology, and provided the navy and the nation with a new capability and level of experience. Prior to the frigate program, design and construction of major warships had never been attempted by Belgium's shipbuilding industry. Therefore, a high degree of modern warship technology was acquired by the nation through the program.¹³¹

Extensive technical assistance was provided by the Royal Netherlands and French Navies during every phase of the program. Moreover, logistic support agreements between these nations cover the maintenance, repair and overhaul of most major systems in the naval shipyards of



the nation which supplied the equipment. Additional technical assistance was provided by Canada, Italy, Norway, the United Kingdom and United States.

After the frigates became operational, each ship performed its Safety and Operational Sea Training (SOST) in Portland, U.K. under the Royal Navy. Four to five weeks of Basic Operational Sea Training (BOST) was also provided two frigates by the Royal Navy in 1978. Most significant, however, is an unusual agreement for routine operational training and deployment of Belgian frigates with the Royal Netherlands Navy for 4 1/2 months each cycle period. It is difficult to imagine any such scheme outside the NATO alliance, and it certainly represents a high degree of cooperation between these two navies. Although multilateral training programs are routine among military powers, it is unusual to find a nation which allows the total integration of another nation's units within its armed forces.

3. Operational Program

Upon completion of the break-in periods for the four frigates, the navy plans to establish a rotation system wherein two ships will remain in active service, one unmanned in ready reserve, and one in overhaul. Whether or not this will be a permanent program is not yet determined. In any event, Belgium will have three frigates available at any one time.

The tentative operational cycle for the two active ships will be 18 months divided into three, four and one-half month schedules separated by short vacation and upkeep periods. The first period will be spent executing national missions and individual ship's training; the second period is devoted to work-up and training in an operational Dutch squadron and; the last period will consist of a short deployment with the forces of STANAVFORLANT.¹³²

Naval vessels are normally assigned to STANAVFORLANT for a full operational year to maximize continuity and enhance training as a combined force. Belgium will undoubtedly follow suit and assign one frigate for the full period of time after the initial frigate crews are fully trained. As in the case of all new classes of ships, the "bugs" must be worked-out prior to attempting any long-term deployments. It is doubtful that Belgium will commence year-long deployments with STANAVFORLANT before 1980 or 1981.

C. MINE COUNTERMEASURES FLOTILLA 22

The lessons learned from two world wars, Korea, and even Viet Nam indicate that mine warfare is still an important aspect of naval warfare, and one which is often neglected. For example, Table II shows the current NATO MCM forces plus a comparison with force levels for

TABLE II

NATO MCM FORCES
(Surface Vessels except as noted)

<u>Nation</u> ^a	<u>1965-66</u>	<u>1975-77</u>	<u>1977-79</u>
BE	31 (+1 MCSC) ^b	30 (+2 MCSC) ^b	27 (+2 MCSC) ^b
DEN	12	8	8
FDR	57	57	57
GREECE	20	14	14
ITALY	78	42	44
NL	62	37	37
NOR	15	10	10
PORT	18	4	7 (+3 RES) ^c
TURKEY	20	25	25
U.K.	101 (+33 in REFIT/RES) ^d	40	34 (+9 TRG) ^f
USA	200 (APPROX)	3 (+25 RES) ^c (+2 HMs) ^e	3 (+25 RES) ^c (+2 HMs) ^e
FRANCE	50	39	38
TOTALS	664	309	302

NOTES:

- a. Canada maintains no MCM vessels
- b. MCSC - Mine Countermeasures Support and Command Ship
- c. RES - vessels in reserve
- d. REFIT/RES - in overhaul or reserve
- e. HMs - Helicopter Mine Countermeasures Squadrons
- f. TRG - dedicated to Training

SOURCES:

The Military Balance: 1977-1978, The International Institute for Strategic Studies, (London: Adlard and Sons Ltd.), pp. 6-22.

Floyston A. Weeks, The Significance of Soviet Mining Against NATO Sea Lines of Communications, p. 54.

selected years. The apparent drastic decline in numbers, although significant, is primarily caused by a serious reduction in the MCM forces of the United States and total absence of MCM forces in the Canadian navy. Most of the other NATO navies have not only maintained their MCM fleet size, but have also increased their capabilities by replacing large numbers of small coastal mine countermeasures vessels (MCMVs) with medium-sized MCMVs which incorporate sweeping and hunting countermeasures in one hull. Moreover, the latest state-of-the-art MCM equipment and techniques are employed which provide a greater level of MCM capability with smaller fleets.

Despite that fact that the United States has opted to concentrate almost exclusively on air mine countermeasures (AMCM) with helicopter mine countermeasures squadrons (HMs), the navies of NATO Europe have determined that MCM-equipped vessels are best-suited for the waters, climate, and geography of the English Channel, North and Baltic Seas, and their approaches. Notwithstanding this divergence in approach to the MCM threat, NATO members agree that no matter how powerful, skilled, or efficient, the rest of their naval forces are useless if they can be bottled up in port by mines.¹³³

The Belgian Navy was born to mine warfare operations. As noted above, its first mission was to clear the coastal waters of Belgium after World War Two. Since those early days mine warfare has played a major role in the navy's

primary mission of protecting the merchant fleet and the nation's sea lines of communication. Today the MCM fleet comprises 27 minesweepers and minehunters plus two command and logistic support ships. Relying upon the most advanced techniques and equipment, the navy possesses the capability to counter every type of mine known to exist. Specifically, greater emphasis has been placed on mine-hunting over minesweeping. Recent advances in MCM sonar performance combined with remote-operating underwater demolition delivery vehicles provides the MCMVs with a capability to counter even unsweepable mines and anti-minesweeper mines. Generally speaking, minehunting is faster than sweeping as a hunter does not have to contend with delayed arming mechanisms, ship counters, or a host of other devices intended to complicate the sweeping effort. This does not mean, however, that minesweeping is an obsolete MCM method. Poor sonar propagation conditions and mine burial often require the more traditional sweeping method which has changed little over the past three decades.

Prior to a review of the Belgian MCM fleet, it must be noted that Belgium's most significant contribution to the NATO MCM effort is through the Belgian-Netherlands Mine Warfare School which provides the best MCM training in NATO.¹³⁴ Finally, the research conducted by both Belgium and the Netherlands in mine burial, bottom contours, sonar propagation, and other aspects of mine warfare has provided



NATO Europe with a comprehensive body of knowledge to successfully counter the mine threat.

1. Mine Countermeasures Support and Command Ships (MCSC)

Two MCSCs, the Zinnia and Godetia, provide afloat logistic support and repair facilities for an entire MCM task group and alternately serve as the flotilla flagship. These ships are actually 325 foot MCM mother-ships with workshops, magnetic cable retrieval and repair facilities, medical suite, and staff MCM operations centers. Spacious cargo holds for MCM gear and provisions, plus hydraulic cranes fore and aft allow the MCSC to operate as an autonomous unit with its MCM flotilla.¹³⁵ A helicopter hanger and embarked helo team provides rapid delivery of spare parts, repair personnel, medical evacuations, and communications link to units operating at a distance from the task group commander. The helicopter can also carry a portable monoplace decompression chamber which allows the transfer of a diver to the modern, fully equipped two-man chamber on board the Zinnia. The Belgian Navy is the only NATO member with this military capability within its armed forces in Northern Europe. All other navies must attempt to find a suitable shore-based facility to treat diving accident victims.

The Zinnia and Godetia offer spacious crew accommodations and are ideally suited for extended deployments.



As a result, these ships often make fisheries protection and goodwill cruises when not actively engaged in MCM activities.

2. Ocean Minesweepers - Minehunters (MSO - MHSO)

The navy's seven ocean minesweepers were built for Belgium in the United States between 1955 and 1960. Six of these wood-hulled vessels are equipped with the American variable depth MCM sonar, SQQ 14, and each will shortly receive the French minehunting disposal device PAP.¹³⁶ Unfortunately, the magnetic and acoustic sweeping equipment must be removed to provide sufficient space for the PAP installation. In gaining the advanced minehunting capability each converted MSO retains only the mechanical sweeping gear used against moored mines. Magnetic and acoustic or combined sweeping tasks must then be executed by the coastal minesweepers which are well suited for Belgium's execution of magnetic-acoustic MCM taskorders.

This division of responsibility is still a somewhat controversial subject as some MCM staffers believe that only an MSO can produce the high amperages required to detonate magnetic mines. especially those planted at maximum effective depths. On the other hand, proponents of minehunting point to the impressive detection rates of the hunters over the sweepers, the smaller number of



ships and men required to execute the same tasks as sweepers, and the significantly reduced time periods required by hunters to sanitize an area. This writer's experiences indicate that hunting is far superior to sweeping and that the loss of magnetic-acoustic capability is small compared to being able to literally see the bottom with a good sonar and PAP system. Nonetheless, some degree of magnetic-acoustic capability must be retained for those areas not suitable for minehunting.

The seventh MSO serves as a training and diving ship for the underwater demolition teams. The only way to confirm mine-like contacts as mines is by seeing or exploding the objects. Prior to the introduction of the PAP system with its television camera and spotlight, divers were sent down to verify mine contacts, place explosive charges, or render the mines safe. Although PAP greatly simplifies this task, divers are still required when mine recovery is desired to gather mine intelligence.

The diving ship is also equipped with a portable monoplace decompression chamber in addition to a multi-place chamber installed on board. In combination with the facilities of the Zinnia and the ultra-modern facilities at the Naval Command Ostend, diving accidents, though rare in occurrence, are rapidly and expertly handled.



3. Coastal Minesweepers - Minehunters (MSC - MHC)

The Zeemacht's six coastal MCM vessels were built in Belgium during the years 1954-1956 under the United States MDAP Program.¹³⁷ Four of these vessels are configured as minesweepers with complete mechanical, acoustic and magnetic capabilities. Two vessels have been converted to minehunters and are equipped with the British hull-mounted sonar MK 193 and with PAP. These MHCs were the test and tactical evaluation platforms for the PAP device during 1976 and 1977. The PAP Performance Evaluation Program results showed a substantial reduction in mine detection times and an increase in detection rates over previous minehunting techniques.¹³⁸

Although coastal minesweepers and minehunters are well suited to the water depths off Belgium's coast, they are small vessels with poor seakeeping capabilities during heavy weather. Crew fatigue is particularly acute in rough waters, whereas the much larger MSOs can continue to operate effectively in higher sea states. Nevertheless, the coastal MCMVs provide a significant MCM capability in both conventional methods and modern minehunting techniques.

4. Inshore Minesweepers (MSI)

As the name implies, inshore minesweepers are the shallow water workhorses of the MCM fleet. Their

extremely shallow draft allows them to operate close to the shoreline and in rivers and channels where rapid shoaling becomes a problem for the larger MCM units.¹³⁹ Belgium built 16 MSIs between 1955 and 1957; the first eight with U.S. credit under the Off-Shore Procurement Program and the remainder with Belgian financing. The six ships comprising Squadron 219 are presently assigned to Flotilla 22 as indicated in Appendix A. The ships of Division 218.1 are permanently assigned to the Naval Command Ostend as Ready Duty Ships (RDS). Division 218.2 is dedicated to naval reserve training and operates out of Kallo under the Naval Command Antwerp. Thus, Flotilla 22 has six MSIs available on a permanent basis but would be able to draw upon these other units should a crisis so demand.

These small MCMVs possess a full range of magnetic, acoustic, and mechanical sweeping devices which, like those of all other Belgian sweepers, may be used alone or in combination. The primary employment of the MSIs is to execute MCM tasks in the narrow entrance channels, rivers, and harbors of the nation. Despite the small size of these vessels they often exercise with their larger counterparts in the major North Sea coastal routes and occasionally as far away as the Atlantic coast of France.



5. Trinational Minehunter Program

The Belgian government has recognized that the navy must have new MCMVs if it is to continue to carry out its NATO responsibilities. By 1980 the MCM fleet will be more than 20 years old, with many units approaching 30 years of service.¹⁴⁰ Old, wooden ships are dysfunctional and costly to maintain due to the types of wood and skills required to make major hull and deck repairs. Fortunately, this problem also faced many of Belgium's allies, and a unique opportunity for cooperation presented itself.¹⁴¹ In response, France, the Netherlands and Belgium have entered into a joint minehunter design and construction program as the first stage of a two-stage plan to increase their MCM capabilities and increase their NATO bonds.¹⁴² The first stage comprises the design and construction of a new generation of medium-sized MCMVs and their logistics supply system. The resulting "Tripartite Minehunter" is in the prototype construction phase. It will provide a fully automated minehunting capability for the detection, classification, identification, localization, and neutralization of bottom and moored mines. The ships will be equipped with the French DUBM 21A twin beam sonar, an EVEC sonar display system, radar, automatic radionavigation system, and automatic pilot.¹⁴³

Delivery dates run from 1979 to 1989 for 15 ships each for France and the Netherlands and ten ships for



Belgium. Each country has the option to purchase additional vessels during the contract period. The Belgian delivery dates are spaced from 1983 to 1987. Consequently, the navy will continue to modernize its existing fleet.¹⁴⁴

The trinational minehunter has been designed to provide a modern ship large enough to be seaworthy in the Atlantic and yet small enough to operate in Belgian harbors. Moreover, and perhaps even more important for the Zeemacht, these vessels will allow a 33 percent reduction from the typical MSO crew sizes, for a total saving of 200 personnel for the ten-ship class.

The second stage of this program will investigate non-conventional means of countering the mine threat. Although this stage of the MCM program will not reach fruition until the late 1980's and early 1990's, current thinking involves the possible use of helicopters, hovercraft, and remote-controlled vehicles to name but three likely candidates.¹⁴⁵

As further discussed in the following chapter, the scope and degree of cooperation between Belgium and her allies is not only most impressive; it also provides greater strength to the NATO alliance. Belgium and the Belgian Navy often act as catalysts in joint ventures which are inestimable in value to NATO. The frigate and trinational minehunter programs are but two examples which demonstrate such increased levels of cooperation among alliance members.



D. OTHER FORCES

As indicated in Appendix A, the navy also maintains various forces to complement the major fleet units. River Patrol Squadron 217 consists of six fast patrol boats engaged in maritime police duties on the Scheldt River and major inland waterways of Belgium.

Two auxilliary units, Zenobe Gramme and Mechelen, are assigned to execute national and NATO hydrographic research projects. Several of these projects are discussed elsewhere in this study.

Recognizing the need for additional fleet support facilities for the new frigates, the navy has recently converted two MSCs to provide a torpedo and missile recovery vessel, and a limited degaussing control capability.

Finally, in addition to the normal assortment of yard and harbor craft, tugs, and small craft, the navy possesses a small air arm designated Helicopter Squadron 40. This squadron consists of one Sikorsky S-58SS1 and three French SA3116B Alouette III helicopters. The Sikorsky is dedicated to rescue and assistance operations but also possesses a limited air mine countermeasures capability which is seldom utilized. The Sikorsky with an operational radius of 72 nautical miles is well suited for Belgium's small coastal area. The Alouette IIIs, on the other hand, are small, fast, and possess a 500 nautical mile range. They are capable of performing a wide range of tasks either



embarked on an MCSC or from their normal base of operations, the Belgian Air Force Base at Koksijde.

The Navy is authorized only seven pilots and the minimum number of personnel required to service their aircraft. It is a small naval air community and fully integrated into the fleet. All pilots are also seagoing officers who serve in department head and executive officer billets in ships which conduct extensive helo operations, and the safety record of the naval air arm is outstanding.

Although the Belgian naval air arm is small it provides a significant degree of increased mobility to the navy, especially the MCM task group. This increased mobility is well worth the expense and effort to maintain a separate naval air capability, as proven during annual exercises. The ability to rapidly transfer accident victims, repair parts and personnel, provisions, and equipment has significantly reduced the transit times which were formerly required for ships to return to port for repairs and supplies.

E. FLEET TRAINING AND READINESS

The annual training plan is designed to maintain the fleet at the maximum level of readiness to accomplish its wartime missions. The Belgian Navy identifies three phases of training and instruction designed to meet the



demands of the individual, the nation, and NATO.¹⁴⁶ The first phase of operational training is oriented toward forming highly qualified teams on each ship. Extensive individual and team training is provided in service schools and the Mine Warfare School for the MCM fleet. Frigate personnel receive additional training in service schools of foreign navies and in programs such as the Belgian-United States Navy Personnel Exchange Program (PEP). Under the PEP program two officers and three petty officers serve for two years in major US Navy combatants and gain valuable experience not obtainable in a smaller navy. Assignment of Belgian personnel is made to Mediterranean-deploying units to ensure maximum operational training.¹⁴⁷

One month of individual ship's training is scheduled during the first part of each operational year which begins in January. Independent ship's exercises (ISE) are programmed by squadron and unit commanders to suit the needs of their personnel. Upon completion of this "individual base training" the ship is designated RFE or ready for exercise.¹⁴⁸

The second training phase, lasting three to four weeks, then begins. Training cruises and national maneuvers under the authority of COMOPSNV are executed through the operational control of the squadron or, preferably, the flotilla commander. The intent is to ensure that all units are properly versed in the tactics necessary to make each ship



ready for participation in allied formations. Once a ship has successfully passed this "national group training" it is designated RFD or ready for duty.

The final or third phase of annual training consists of at least two bi- or multi-lateral exercises and two large-scale NATO exercises.¹⁴⁹ One Belgian MSO is also assigned yearly to STANAVFORCHAN, as will one frigate to STANAVFORLANT in the future. These multilateral exercises and NATO exercises help to develop common tactics, strategy, and to foster a greater degree of cooperation among NATO nations. For example, the French Navy annually invites its neighboring allies and STANAVFORCHAN to its major MCM exercise, NORMIMEX. This is usually the most comprehensive MCM exercise in NATO Europe, and it provides all participants operating experience with their French counterparts who are not presently in the military structure of NATO. Moreover, the exercise analyses are widely distributed and scrupulously studied by all participants. Training plans are often tailored to the conclusions and observations of these analyses. Multi-national MCM exercises, especially NORMINEX, have played a major role in enhancing NATO's ability to counter the mine threat in Europe and they continue to play a major part in the training cycles of each participating nation.

The multi-national phase of frigate training has yet to begin. However, the Netherlands has agreed to assign Belgian frigates to fully operational squadrons to ensure



maximum training for Belgian personnel. Additionally, at least one major exercise will be included during the assignment period of Belgian ships to Netherlands' squadrons. Presumably, this will be a major NATO exercise. There is little doubt that the experience of working with the Royal Netherlands Navy and STANAVFORLANT will result in a very high degree of readiness for the Belgian frigates, as is already the case with Belgium's MCM fleet.



V. THE STRUCTURE AND ORGANIZATION OF THE BELGIAN NAVY

A. THE NATIONAL DEFENSE ORGANIZATION

The King is the Commander-in-Chief of the Belgian Armed Forces as stipulated in the Constitution of 1831 and its amendments. During World War One and Two, the King physically led the armed forces and served as a unifying symbol of patriotism. After the successful resolution of the "Belgian Royal Question" in 1951,¹⁵⁰ the King, although still legally head of the armed forces under the constitution, was relegated to a figure-head of the military.¹⁵¹ As nominal commander-in-cheif he is no longer expected to be personally responsible for the defense of the nation, but rather exercises his constitutional responsibilities and authority through his Prime Minister and Cabinet who share overall responsibility for defense policy and control of the armed forces.

Specific defense decisions and executing directives are formulated by the Ministerial Committee on Defense which is presided over by the Prime Minister. The Minister of Defense implements the policies and decisions of the defense committee through his administration which includes three elements within an integrated staff echelon that coordinate planning, operations, and support of the three branches of the armed forces, the Gendarmerie, and the

Medical Service. The integrated elements of the Ministry of Defense are the Gendarmerie General Staff, the Central Administration, and the General Staff.¹⁵²

The Gendarmerie General Staff is responsible for overall domestic security and control of the national police - the Gendarmerie. Although equivalent to state police, the Gendarmerie are more heavily armed than is necessary to perform most of the usual police duties. Their training and organization are oriented toward a possible wartime role in direct support of combat troops.¹⁵³

The Central Administration provides integrated support to all the armed forces, the Gendarmerie, and the Medical Service in order to reduce redundancy in each service and to efficiently administer selective service conscripts. The Central Administration, staffed by each service and civilians, maintains close liaison with the other general staffs.

The General Staff is the most important element of the integrated staff echelon and operates similar to the American Joint Chiefs of Staff System. The Chief of the General Staff comes directly under the Minister of Defense to whom he is responsible for the readiness and coordination of the three armed forces. Compliance with the directives and policies of the Ministerial Committee on Defense is coordinated by the Chief of the General Staff with the heads of the Army, Navy, Air Force, and the Medical Service. An integrated Inter-Service Staff with two deputy chiefs of staff assists the Chief of the General Staff in carrying



out his duties. The First Deputy Chief of Staff is responsible for the coordination of plans, programs, and educational instruction which apply to all the armed forces. The Second Deputy coordinates the programs concerning inter-service problems in the areas of personnel, information, operations, and logistics.¹⁵⁴

Each of the armed forces and the Medical Service has its own staff under the direction of its respective chief of staff who reports directly to the Chief of the General Staff. These staffs ensure compliance with directives in force, individual service policies and planning, and make routine reports concerning the state of readiness of their assigned forces.

B. ORGANIZATION OF THE NAVY

The organization of the Belgian Navy is similar to the United States Navy except that, owing to its size and the functions of the General Staff and Inter-Service Staff, the American multiplicity of administrative levels is not required. The Naval Staff is located in Brussels and presided over by the Chief of the Naval Staff who is equivalent to the United States Navy Chief of Naval Operations. The Naval Staff is responsible for implementing the policies and decisions of the General Staff which relate to the navy. As in any headquarters command, the Naval Staff directs the preparation and submission of budgets, personnel management and recruitment, short-and long-range



planning, procurement of major weapons systems and ships, information to various governmental agencies, public relations, and the administration of the Naval Reserve to name but a few of the tasks which are routinely addressed. The staff is quite small due to the limited number of authorized personnel, the requirements of the fleet, and other subordinate commands, and the number of personnel in a training status. Approximately three percent of the navy's strength, about 130-140 men and women, are assigned to the headquarters command which also includes those personnel assigned to inter-service staffs and diplomatic billets.¹⁵⁵ Thus, personnel must be judiciously utilized in order to successfully accomplish all required planning, reporting, and tasking of the General Staff while at the same time directing the operations of the navy.

The distribution of responsibilities within the Naval Staff are functionally divided into the following six Navy Departments which are also duplicated on each subordinate command level:¹⁵⁶

- N 1 - Personnel and General Administration
- N 2 - Information and Security
- N 3 - Operations and Planning
- N 4 - Supply and Logistics
- N 5 - Communications
- N 6 - Finances and Budget

Beneath the level of the Naval Staff the navy comprises three functional commands, (Operations, Logistics, and Instruction), and the Belgian-Netherlands Mine Warfare School.

1. The Operations Command - COMOPSNV

The operations Command in Ostend is the operational control authority (OCA) of the navy. As such, COMOPSNV is the naval command with the authority to direct, assign, deploy, and reform force groupings; in short, it has the authority for the movements of the fleet. The Commander, Naval Operations, Belgian Navy exercises full command over all naval bases and fleet units in active service wherever they are operating.

COMOPSNV is also responsible for the protection of all vessels in the coastal and territorial waters along Belgium's 42 mile coastline. Other areas of coastal jurisdiction include the Belgian Air-Sea Rescur Sector with a northern limit of 52 nautical miles and a southern limit of 21 nautical miles, and a ten nautical mile wide Oil Pollution Section. Pollution prevention and control within the harbors and rivers is delegated to the naval base commanders.¹⁵⁷

The primary task of COMOPSNV is fleet readiness to accomplish the navy's wartime missions. Consequently, annual employment schedules are drafted in the Operations Command to ensure proper coordination of training cycles,

overhaul and repair schedules, exercise requirements, and various miscellaneous missions tasked by the Naval Staff. In short, COMOPSNAV is the heart of the operating fleet.

Two subordinate commands exist to assist in executing employment schedules, planning, training and administration, and to provide logistic support to assigned units. Commander, Mine Countermeasures Flotilla 22 (COMFLOT 22 or FLOT 22) and Commander, Frigate Squadron 181 (COMSQUAD 181 or SQUAD 181), serve as the navy's two type commanders with full responsibility for training, administration, and logistic support within their capabilities. (Logistic support is provided at four echelons in the Belgian Navy: First Echelon: by the ship; Second Echelon: by the Type Commander and naval bases; Third Echelon: by the Logistics Commands and; the Fourth Echelon: by civilian shipyards or repair facilities.) The title of the frigate type commander, COMSQUAD 181, belies that fact that he is equivalent in rank and authority to COMFLOT 22. Evidently the navy decided that four frigates could be designated only a squadron as any other title would sound presumptuous. FLOT 22 on the other hand, consists of three mine countermeasures squadrons and the mine countermeasures command and control ship.¹⁵⁸

The navy presently operates three naval bases which provide second echelon logistic support and homeporting to the fleet. Naval bases are designated Naval Commands (NAVCOMs) to provide standardization of terminology with



Belgium's close ally, the Netherlands. Consequently, the bases at Ostend, Zeebrugge, and Antwerp are NAVCOMOST, NAVCOMZEB, and NAVCOMANT, respectively. (See Map 1)

Naval bases are considered major shore commands with respect to career patterns and promotion criteria. Each NAVCOM reports directly to COMOPSNV for the following primary responsibilities:

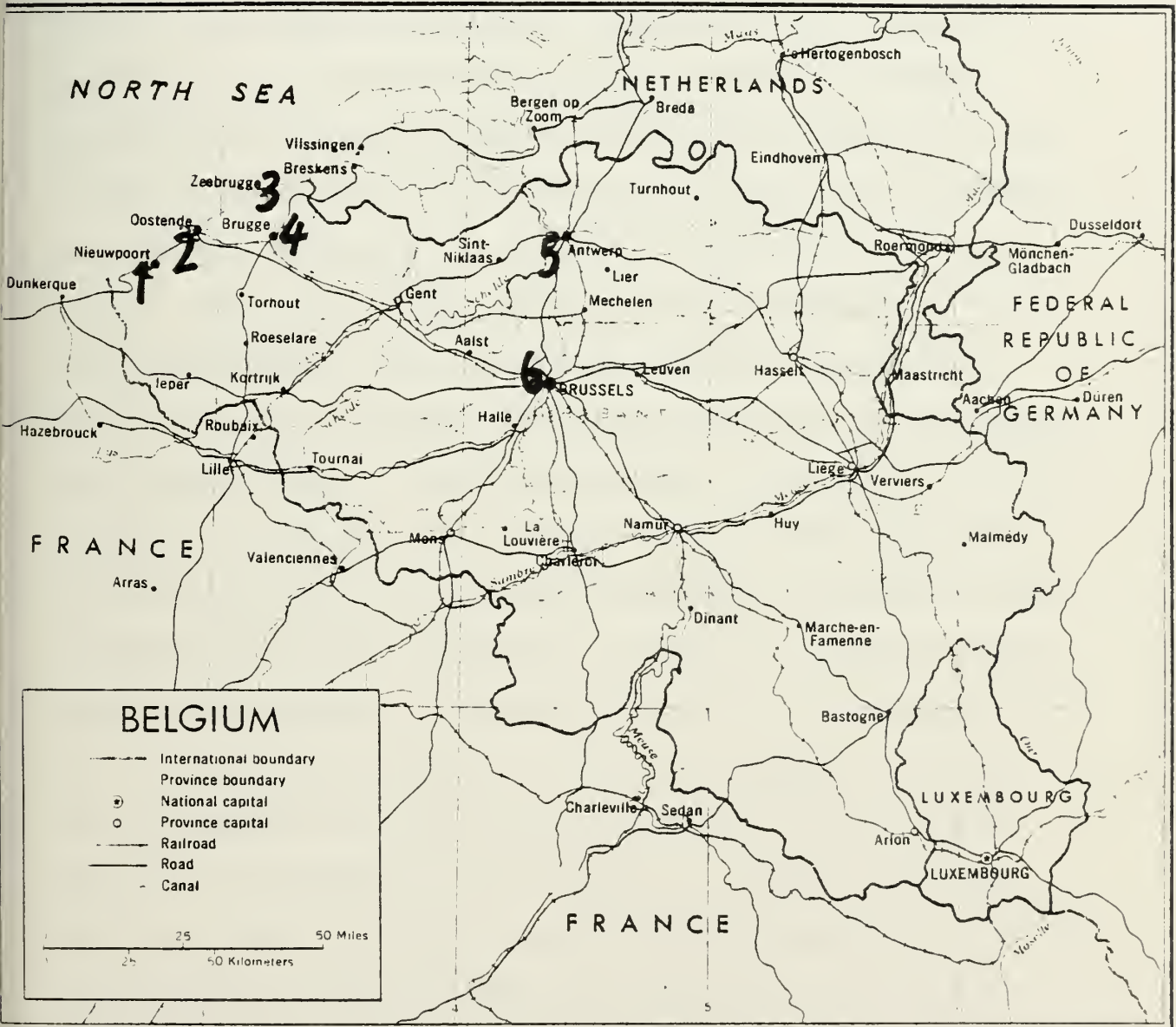
- safety of ships in their port
- second echelon logistic and administrative support
- defense of the base area and installations
- the operation of the Naval Coastal Radar Chain
- manning the Port War Signal Stations (PWSS)

COMOPSNV also maintains operational control over the Navy Clearance-Divers Section with its associated Diving School and the operation of the Hyperbar Center which is the navy's medical diving and decompression facility.¹⁵⁹ Naval communications transmitter and receiver stations, plus the reserve naval base at Nieuwpoort also fall under the cognizance of the Naval Command Ostend.¹⁶⁰

2. The Logistics Command - COMLOGNAV

COMLOGNAV provides third echelon logistics support to the fleet and is roughly equivalent to a United States Navy Ship Repair Facility. It encompasses all of the navy's repair capabilities. Located in Ostend alongside a 400 meter wharf, the Logistics Command, with 88 military



BELGIUMLOCATION OF BELGIAN NAVAL FACILITIES

1. Reserve naval base-NAVCOMPORT, Nautical School
2. COMOPSNV, NAVCOMOST, COMLOGNAV, EGUERMIN
3. NAVCOMZEB, MCM FLOTILLA 22, FRIGATE SQUADRON 181
4. COMIENAV
5. NAVCOMANT
6. HEADQUARTERS OF THE BELGIAN NAVAL STAFF

SOURCE: Defense Mapping Agency, June 1969.

personnel, and several hundred civilian contract employees, is responsible for the replenishment, maintenance and repair of the entire fleet.¹⁶¹

As in the area of personnel, the problems of a small navy become quite apparent in the Logistics Command. First, a shortage of qualified technicians to effect repairs on new, sophisticated equipment requires hiring civilian technicians or negotiating factory contracts, both of which are expensive.¹⁶² Whenever possible navy personnel are trained to repair new equipment introduced into the fleet. When that is not feasible, naval technicians work side-by-side with repair personnel from civilian firms. This on the job training proves very effective in expanding the capabilities of these technicians. Furthermore, depending upon the origin of a system, foreign naval assistance is often written into purchase agreements to provide either training for Belgian personnel or repair by foreign technicians. For example, a recent agreement between Belgium and the Netherlands provides for the main overhaul in Dutch naval shipyards and electronics workshops of all weapons, sensors, and command systems fitted in Belgian frigates which are also in use by the Royal Netherlands Navy. Similar agreements are also in force with the French and British navies or civilian firms from which equipment was purchased.¹⁶³ In this way the navy is able to expand its repair capabilities without overextending its present repair and overhaul capabilities. Therefore, COMLOGNAV can



continue to provide quality repairs within its area of expertise while gradually acquiring the new skills needed to maintain the frigates.

A second problem area involves the budget and availability of repair parts. The navy is small and cannot afford to stock repair parts on a level normally expected by larger navies. Naturally, rapid turnover items are readily available and the navy stockpiles more than 70,000 spares. Relative to the United States Navy this is a small number. However, compared to 50,000 spares in the largest American assembly plants, the figure is not so small.¹⁶⁴ Expensive or seldom required spares cannot be maintained and often must be special ordered from foreign stockpiles. This causes delays in some cases, but more often than not, the part is available from one of the ships in reserve. Thus, cannibalization is an art well-known to the navy. Moreover, the navy has become expert in fabricating spare parts which are not available.

One might argue that it would be better to maintain a full range of spares and cease the practice of having ships in reserve. This, however, overlooks three important benefits of the navy's rotational-reserve system. First, although manpower may not be available to man all the navy's ships in peacetime, these ships are kept ready for immediate use in an emergency and could be manned by reserves if necessary. Second, maintenance, repairs, and overhauls can be conducted in an efficient manner without reducing the



number of vessels required to execute peacetime missions. Third, the navy is able to maintain the number of ships it determines necessary to execute its wartime missions. Moreover, by utilizing the rotational-reserve concept, the navy has ready replacements for active units which experience major casualties. The experience of this writer can attest to the soundness of the Belgian system. It not only works well, but also keeps the fleet in a much higher state of readiness, and prolongs the life of the ships. Compared to United States Navy minesweepers, the Belgian units are in a considerably higher condition of preservation and upkeep.¹⁶⁵

Although the small navy problems of COMLOGNAV have not been solved, they are recognized and ameliorated as much as possible by experience and innovative programs. The area of true expertise at COMLOGNAV is MCM. Having dealt with primarily MCMVs during the past three decades, the Logistics Command possesses a wealth of knowledge and skills in all areas of mine countermeasures vessels and systems. The construction and design of the MCM command and support vessels reflect this expertise as those ships are capable of providing even major repairs at sea to all types of minesweepers and minehunters. For example, during a major MCM exercise in 1977 a FLOT 22 repair team effected major generator repairs to a coastal minesweeper in less than 17 hours. The normal time required for such repairs was four days, and then only if the ship was at pierside.¹⁶⁶



COMLOGNAV provides third echelon logistics support to the fleet which includes technical inspections, preventive maintenance beyond the ship's capability, breakdown services, and replenishment of foodstuffs, fuel, and consumables.¹⁶⁷ The type commanders in cooperation with COMLOGNAV provide some third echelon logistics by maintaining large stocks of spares, food, fuel, and consumables within design capacity. During major exercises or training cruises to distant areas, supplemental spares are issued to the type commander to increase his supply support and repair capabilities.¹⁶⁸

The task of the Logistics Command is large, and like any navy's repair facility, judged by performance. The estimate of this writer is that COMLOGNAV provides services and repairs, at least if not superior, on a par with those of the United States Navy.¹⁶⁹

3. The Instruction Command - COMIENAV

The Instruction Command or COMIENAV either provides or coordinates the training for all enlisted personnel in the Belgian Navy. The importance of training and the emphasis placed on it by the navy is reflected by the fact that 27 percent of the navy's total manpower authorization is assigned to the various training school staffs.¹⁷⁰

Current school enrollments account for 12 percent (about 530 personnel) of the navy's manpower. Consequently, nearly 40 percent of the navy is involved in training and



education either as instructors, administrators or students. The figure is presently higher than normal due to the more than 40 different courses required for the initial training of frigate personnel.¹⁷¹ Nonetheless it is indicative of the training required to operate even a small modern navy.

COMIENAV provides all recruits and conscripts five weeks of basic military instruction which introduces them to military life. Following this boot camp period advanced instruction prepares sailors for one of the shipboard departments: deck, engineering, operations, or supply. Likewise, personnel going to shore duty receive instruction appropriate to their specialization.¹⁷²

The Petty Officer School also comes under COMIENAV and provides candidates with up to three years of training and education in one of the three specialization schools for deck, engineering, and services personnel.¹⁷³ When required, additional training is arranged in the service schools of foreign navies.

Several navy ratings such as hospital corpsman, military police, disbursing clerks, and chauffeurs are taught in various training schools of the Belgian Army. These quotas are controlled by the Instruction Command as the navy's primary training authority.¹⁷⁴ A limited number of officer courses are given by COMIENAV in the areas of nuclear, biological, and chemical warfare, and damage control, otherwise officers receive most of their

training during military school or in foreign navies depending upon the needs of the navy.¹⁷⁵

The overall quality of training and education in the Belgian Navy is equal to that of other navies as judged by the performance of naval enlisted personnel. The leading and chief petty officers possess a greater theoretical knowledge than their American counterparts, especially in the area of mine warfare. This may be due to the navy's long concentration on mine countermeasures or that a comparison is not possible due to the United States Navy's almost constant denigration of mine warfare. Furthermore, observed performance in the areas of navigation, detection, helicopter air control, operations during fleet exercises, and routine steaming indicate a high degree of knowledge and ability on the part of most petty officers and career sailors. The quality of training is of a high caliber and more than sufficient to enable the navy to safely and expertly execute its missions.

4. The Belgian-Netherlands Mine Warfare School -
EGUERMIN

The Belgian-Netherlands Mine Warfare School, EGUERMIN (l'Ecole de la Guerre de Mines), is the only institution of its kind. It stands as evidence of the depth of commitment to mine warfare and collective security by the governments of Belgium and the Netherlands. Originally founded in 1958 as the Belgian Mine Warfare School, it provides instruction

in all aspects of mine countermeasures and mine warfare.¹⁷⁶ The first foreign students were admitted in 1961, coming primarily from West Germany and the Netherlands. A Bilateral agreement signed in 1965 merged the schools of Belgium and the Netherlands, and the Mine Warfare School in Den Helder was moved to the Ostend facilities. Funding for the school, its instruction, and research projects is shared equally by the two nations.¹⁷⁷ The degree of cooperation of these two allies in mine warfare is but one more example of the close relationship between Belgium and the Netherlands. It also represents another innovative approach to provide quality training which allows a small navy the opportunity to build an effective mission capability in a cost-effective manner. Moreover, the combined MCM expertise of the Belgian and Royal Netherlands Navies is reflected in EGUERMIN being called the "Belgian-Netherlands Mine University," which is not a great exaggeration.

The Director of the school is responsible to the chiefs of staff of both navies. Matters concerning policy and major activities are supervised by an eight man "Supervision Council" with equal representation from both navies. The yearly council meetings are alternately presided over by the Belgian or Netherlands Deputy Chief of the Naval Staff. An advisory board composed of two Belgians, two Netherlands, and the Director as chairman, provides a forum to handle all matters concerning instruction.¹⁷⁸

The Training Commander is of the opposite nationality of the Director. He is responsible for all instruction, training schedules, and training-related activities. Both the Director and Training Commander are senior officers in either the Belgian or Royal Netherlands Navies, the nationalities of each position are alternated every two or three years depending upon tour lengths.

Due to the composition of the school's staff many people think it is a NATO-related organization. Despite the fact that one officer and one petty officer from the United States Navy are assigned to EGUERMIN, it is not a part of NATO. United States Navy personnel are provided under an agreement dating back to 1958.¹⁷⁹ The remainder of the 8 officer and 18 chief petty officer staff are from the Belgian and Netherlands Navies.

An additional reason for believing that a NATO relationship exists is the large number of NATO naval personnel encountered at EGUERMIN. Approximately 1000 NATO officers and enlisted personnel receive tactical and technical training annually.¹⁸⁰ MCM squadrons from West Germany, Britain, France, the Netherlands, and Belgium make extensive use of the School's Mine Countermeasures Tactical Trainer (MCMTT). Through computer simulation, the MCMTT provides realistic MCM exercises for watch and operations teams in ship control booths which are mock-ups of bridges and combat information centers. The exercise play is recorded to allow extensive critiques



following each session covering radio-telephone and signalbook procedures, MCM tactics and theory, and ship handling. Although the MCMTT is the best MCM tactical trainer in NATO, it is limited to minesweeping evolutions. Hence, EGUERMIN plans to install a minehunting simulator and tactical teacher to be purchased jointly by France, the Netherlands and Belgium. This will be the most advanced and modern MCM facility in existence.¹⁸¹

EGUERMIN also offers a broad range of classroom instruction for all active and reserve naval personnel from seamen to senior officers. Courses vary from a few days for refresher training, to 18 weeks for the Mine Warfare Staff Officer Course. The latter is often attended by senior NATO officers from almost every NATO member nation. The instruction staff is very accommodating and can tailor a course to suit the requirements of the requestor.

Computer assisted wargames are available to MCM staffs from the task unit to the task force level. This provides MCM officers an opportunity to test their skills in areas such as convoy guidance, establishment of diversion routes, naval control of shipping, and experimental tactics. Moreover, the participants normally play at a higher level of authority than they would hold in a live fleet exercise. This role-playing gives a better appreciation of the senior operational commander's perspective and the importance for timely and accurate MCM reporting.

The staff at EGUERMIN also participates in the planning, execution, and analysis of NATO and national MCM exercises. Afloat units can also arrange for real-time computer assistance during the conduct of an exercise. This service has not been fully exploited due to the limited size of the EGUERMIN Staff. During one major MCM exercise this writer requested and received assistance from the school in the analysis of a "Short-Term Operation" which proved highly successful. As indicated, the school staff is small, and it cannot be expected to man the facilities round the clock. Hence, exercise utilization is available only through advance liaison, and then only when the school's workload permits. Lastly, the services of the staff are always at the disposal of MCM officers when they are engaged in the preparation and planning phases immediately prior to major exercises.

The EGUERMIN staff possesses a wealth of MCM knowledge and dispenses it through its multi-faceted training programs. Consequently, the Belgian-Netherlands Mine Warfare School makes a significant contribution to the navies of both countries and to NATO. This contribution cannot be overstated as anyone who knows anything about mine warfare in NATO Europe continually returns to EGUERMIN for the latest information on mine countermeasures.



C. PERSONNEL

The effective utilization of manpower resources plays a significant role in the administration and management of the Belgian Navy. The small number of authorized personnel, skyrocketing costs of pay and allowances, increased length and cost of training, and the reduction in active service obligation of conscripts have made it imperative to define precisely all billet requirements to ensure that qualified personnel, in adequate numbers, are available to man, operate and maintain the systems employed.

The peacetime navy represents only five percent of the total armed forces with 4,486 men and women assigned.¹⁸² The manpower authorization of the navy is set by Parliament upon recommendation of the Ministerial Committee on Defense in consultation with the Naval and General Staff.¹⁸³

Table III shows the strengths of the navy from 1977 through the projected authorized allowance for 1979. From Table III it is evident that although the overall size of the navy is expected to decrease by only 62, the navy will lose 95 naval personnel, experience a large reduction in assigned conscripts, and probably experience an increase in women in uniform, assuming that trend continues. To further complicate the personnel situation, the navy is engaged in two major ship acquisition programs which require increased numbers of personnel assigned to sea duty and training programs oriented toward manning and operating new, highly



TABLE III

BELGIAN NAVY PERSONNEL STRENGTHS

	JAN authorized	1977 assigned	JAN 1978 authorized	1978 assigned	OCT 1978 assigned	JAN 1979 authorized
Officer	350	332	350	332	348 ^c	350
Petty Officer	1571	1518	1571	1546	1566 ^d	1571
Seamen (volunteers)	1430	1406 ^a	1603	1417 ^b	1471 ^e	1800
Seamen (conscripts)	985	985	763	964	953	520
Subtotal	4336	4231	4287	4259	4338	4241
Civilian	150	150	150	150	148	183
Total	4486	4381	4437	4409	4486	4424

a 153 women

b 223 women

c 10 women

d 50 women

e 290 women

SOURCES: Witboek van Landsverdediging, p. 73.; "Reunion d'Information Force Navale," Part C: Personnel, p. 1.; Staf Chef van de Zeemacht Letter dated 12 October 1978, p. 1.

sophisticated naval vessels. Fortunately, some of these programs do not overlap and the intention of the Naval Staff is to provide the nation with a smaller yet more capable navy thanks largely to modern technology. Nonetheless, chronic personnel shortages are not new to the Belgian Navy and it is a credit to their men and women that they are able to accomplish their assigned missions successfully under such austere manning levels. Several of the more salient aspects of the current personnel situation in the Belgian Navy are addressed below.

1. Education and Training Qualifications

- a. Officer Personnel

Education plays an extremely important role in both officer and enlisted development within the Belgian Navy. All newly commissioned officers must possess the equivalent of an American baccalaureate degree with the exception of officers promoted from the enlisted ranks. Midshipmen in the Royal Military School receive either a four or five year technical education in science and engineering. This policy ensures that all unrestricted line and engineering officers have the appropriate technological background necessary to operate and maintain the complex weapons systems of today and the future. This education also prepares them to perform their responsibilities as they progress in their military careers. The navy has two primary methods to upgrade the professional knowledge of

the officer corps. The first is advanced professional military education in selected fields of study at the war colleges of either France, the Netherlands, United Kingdom, or the United States. Depending upon the needs of the navy, one or two senior officers per year are assigned to war colleges in cooperation with the host nations.¹⁸⁴ The purpose of this program is to provide senior officers the opportunity to broaden their expertise in strategy, tactics, and defense management. The second method is to provide specialty courses to selected officers at the service schools of various foreign navies, usually France, the Netherlands, and the United Kingdom. Some of these specialty courses are offered in Belgium through either service schools or the Mine Warfare School.

Since the officer corps is quite stable, this professional education provides the navy with a large cadre of middle grade and senior officers well-versed in operational, technical, and managerial skills.¹⁸⁵ The navy's practice, like that of most European civilian societies, does not emphasize graduate degree-granting programs, but rather stresses the attainment of technical skills and knowledge on a more functional basis. This does not, however, prevent officers from following courses of instruction leading to graduate degrees, and in fact, many officers hold certificates from various universities and institutes which are equivalent to American graduate degrees.

Officers are thoroughly schooled in mine warfare at the Belgian-Netherlands Mine Warfare School. EGUERMIN has provided training to nearly all officers in the navy, including naval aviators, as they also receive tours of duty on non-aviation mine countermeasures vessels during their careers.

(1) Officer Acquisition and Training. Regular officer acquisition is primarily from the Royal Military School which educates officer candidates for all the armed forces. Some officers enter the navy from four year civilian Higher Technical Schools and universities, or the three year Navigation School of the Merchant Marine at Antwerp. An additional small number of officers is acquired from the enlisted ranks by what are called "social promotions."¹⁸⁶ Prior to 1967 a small number of officer applicants were educated in foreign naval academies. This provided a small cadre of officers well-versed in the philosophy of naval warfare from the perspective of Belgium's NATO allies.¹⁸⁷ Since that time all applicants receive their basic education in Belgium since it is more cost-effective. Additionally, the cooperation and technology sharing between the NATO members has improved sufficiently to keep all members fully informed through NATO's many organizations.

All Royal Military School applicants must possess a Higher Secondary School certificate which is equivalent to a United States high school diploma.



Applicants must be physically and mentally qualified as measured by medical, psychotechnic and physical tests. Successful completion of entrance examinations in mathematics, physics, chemistry, history, and geography is required, as well as a thorough facility with their mother tongue and an elementary knowledge of the second national language. Candidates accepted by the Royal Military School follow a four year program to become line or service officers depending upon their program of studies. A five year program educates technical officers and grants an engineer's certificate. All sea-going officers serve a one year "application tour" in the fleet following graduation which completes the educational process.¹⁸⁸

The Officer corps consists of deck officers (line officers), service officers (supply and administration), and engineers. The basic career patterns are similar to those of American naval officers but somewhat more specialized. The navy does not possess the variety of ship-types to offer a broad range of opportunities, but rather concentrates on ASW and MCM missions.

A distinct advantage of the navy's small line officer community is the increased responsibility placed on each member. Officers serve many years together and learn one-another's strengths and weaknesses. This greatly enhances the cooperation and working relationships within the corps. For example, a qualified watch officer is granted complete control of his ship and maneuvers the

vessel as necessary while on watch. In comparison, the United States Navy watch officer must continually call the commanding officer to request permission to maneuver the ship, and then normally does so only in the presence of the commanding officer. This is probably due to the fact that American commanders seldom serve more than once with any particular wardroom and then only for a short period of time. Perforce, the American commander is unable to trust completely his watch officers, as he never gets to learn their capabilities fully. The net result is that Belgian deck officers are better qualified to assume command of a ship having exercised a full range of responsibility during their pre-command tours of duty.

(2) Officer Promotions.¹⁸⁹ The promotion policy of the Belgian navy is based primarily on experience levels attained over time. As in other navies, the number of officers in each grade is set by law, and occasionally promotions must be delayed until vacancies occur.

The distinctive feature of the Belgian Navy's promotion policy is the successful completion of an examination to advance from the Lieutenant Commander to Commander grade. The examination for promotion to senior officer consists of tactical and strategic questions which require answers amounting to a campaign analysis. The test is rigorous and goes well beyond the scope of the navy's missions. It is a comprehensive test designed to evaluate the officer's analytical skills as well as his

total knowledge of naval ships, weapons, naval warfare and maturity. Successful completion does not necessarily mean an automatic promotion; the individual must also be selected. In many respects the Belgian examination corresponds to the examination requirement for command at sea in the United States Navy, although the Belgian examination is also heavy on theoretical analysis. In the event of unsatisfactory performance, one retest is permitted. Failure on the retest means that the officer will retire as a Lieutenant Commander.

The current promotion policy requires the following experience levels for the grades indicated:

<u>Rank</u>	<u>Promotion Point</u> (years in grade)	
Ensign	2	Successful completion of the second year of Military School and legal examinations.
	4	Nomination is confirmed at the end of the Military School program
LTJG	4	Demonstrated performance.
LT	5	Demonstrated performance.
LCDR	5	Demonstrated performance.
CDR	2	Senior Officer Examination and Selection Board nomination.
Frigate Captain	4	Selection Board nomination.
Captain	3	Selection Board nomination.

Commodore	-	Nominated by the King
Division Admiral	-	on Recommendation by
Vice Admiral	-	the Minister of
		Defense.

b. Enlisted Personnel

A recent article in the Belgian Military Magazine, VOX: Militair Weekblad, stressed the importance of schools in "renewing personnel" by providing them with the knowledge and skills required to man and operate the navy's new, highly sophisticated naval vessels.¹⁹⁰ The Belgian Navy has long recognized that it can no longer operate without the high degree of training and specialization acquired only through advanced professional military training and education. Although the bulk of responsibility falls upon the petty officer corps, even seaman cannot escape the impact of modern naval technology as they are also called on to assist in operating and maintaining their ship's installed systems. The Belgian Navy must provide its personnel with the necessary skills to safely man its fleet and successfully accomplish assigned missions. This is a difficult task for a small navy due to budgetary constraints and the extremely limited numbers of personnel available. As a result, the operator-maintainer principle is emphasized. Unfortunately, the increased complexity of naval equipment does not always lend itself to this principle, especially in the area of electronics. Moreover, the technical abilities of many personnel are limited making it necessary to train a few technicians who become the navy's experts on various pieces of equipment.

As a result of building a modern fleet with sophisticated frigates and minehunters, required training is expensive in monetary terms as well as the length of time to master required skills. Therefore the navy has sought cooperation between its allies and industry. For example, the complexity and variety of equipment in the new frigates dictated the establishment of 41 different courses in 1976 alone. These courses are being offered by the navy's training center, COMIENAV, the Royal Netherlands Navy, the French Navy, and industrial manufacturers.¹⁹¹ Furthermore, the duration of each course averages 10-12 months. The net result in time and money is the creation of a cadre of highly skilled technicians of significant value to the navy.

Belgian petty officers, as in most navies, represent the nucleus of highly qualified personnel who actually make it possible for the navy to operate. Due to the small number of personnel more responsibility is vested in the petty officer corps, particularly to chief petty officers, than their counterparts in the United States Navy. They are regularly consulted in areas such as policy formulation and planning, while sharing a large part of the execution responsibilities. This is particularly true in the functional commands and at the fleet level. This reflects the fact that the navy has found it not only convenient but also necessary to provide opportunities of increased responsibility to those petty officers who meet

the requisite standards. Moreover, skilled naval personnel are attractive targets for civilian firms. The navy must compete in the free-labor market and increased responsibility has become a successful manpower management tool.

(1) Enlisted Personnel Acquisition and Training. All personnel entering an initial enlistment are provided recruit training that introduces them to military life. The current length of this training depends on whether the recruit possesses the qualifications to enter at the petty officer or seaman level. Generally speaking, qualified personnel entering at the petty officer level are career oriented whereas men and women entering as seamen either do not possess the qualifications for petty officer, or are conscripts who desire to fulfill their military obligations without imposing upon themselves additional obligations required by the various programs open to them.

Petty officer applicants must possess a completion certificate from Lower Secondary School, which is secondary school through age 15.¹⁹² They must also pass a battery of tests and examinations which include among other things, technical aptitude, effective knowledge of their first language, and mathematics. Those candidates selected receive one year of basic training consisting of military indoctrination and general military subjects. This basic instruction is normally followed by up to two additional years of instruction in the School for Petty Officers.¹⁹³ Depending upon the technical specialty

(rating), the petty officer may be sent to one of Belgium's naval or armed forces technical schools, or a technical school of a foreign navy.¹⁹⁴ Petty officers often receive specialized training in weapons systems from the French Navy and advanced electronics courses in the Netherlands.¹⁹⁵

Men and women entering the naval service as seamen are not required to possess an educational certificate. They must, however, pass a series of "selection tests" to ascertain their effective knowledge of reading, writing, and other general subjects oriented toward the ninth grade level of education. The results of these examinations are used to determine the sailor's aptitude for a particular rating. Seamen then receive from five weeks to six months of basic training depending upon their rating. Conscripts generally receive the minimum instruction necessary to safely serve in the navy and prepare them for sea duty should they be so assigned. Since the obligated active service time has been progressively reduced the navy cannot afford to provide long, expensive training for sailors who remain only ten months on active duty. As the same time the navy must offer sufficient instruction to conscripts as they constitute the naval reserve force.

Seamen who desire to make the navy a career must serve a total of 32 years to receive full retirement benefits. Furthermore, since the petty officer and seamen ranks are separate entities, a seaman must pass special

examinations and complete supplemental instruction to rise above the rank of petty officer third class.

(2) Enlisted Promotions. The Belgian Navy enlisted promotion policy is based upon time in rank, minimum periods of sea duty, and demonstrated performance. Eligible personnel must receive the recommendation of their department head and commanding officer to be designated a candidate for promotion. Actual selection is based upon performance evaluations and a review of the candidate's service record. As in the officer corps, a petty officer may be selected for promotion but have to wait until a vacancy occurs prior to actually receiving the promotion.

The following experience levels are required for the ranks indicated in addition to demonstrated performance:

<u>Rank</u>	<u>USN Equivalent</u>	<u>Promotion Point (years in rank)</u>	<u>Special Qualifications</u>
Second Master	between E-4 and E-5	1	Completion of basic training.
Master	E-5	5	Sufficient sea duty.
First Master	E-6	5	Sufficient sea duty.
First Master Chief	E-7/E-8	8	Sufficient sea duty.
Upper Master Chief	E-9	8	Completion of a special course of instruction and examination. Sufficient sea duty.



Seaman	E-1/E-2	-	Completion of basic training.
First Sailor	E-3	2 1/2	-
Quarter Master	E-4	8	-

2. Women in the Navy

Belgium, like many other nations, has found it necessary to open its armed forces to women. The politically motivated revision of the military selective service system created a large requirement for volunteers. A greater recruiting effort became necessary in order to keep pace with the reduction in numbers and length of service of conscripts, and to aid in the development of the naval reserve force. Thus, it was necessary to utilize all sources of recruits.¹⁹⁶

Thirty women were admitted into the navy as seamen in June 1975, one year after the army first began recruiting women. Although women may enter any field of specialization for which they qualify, they are not allowed assignment to combat positions.¹⁹⁷ The navy competes with the other services and the private sector in a free labor market for the manpower required to fulfill navy requirements. Navy flexibility to respond to changes in the labor market is somewhat constrained by government dictated pay scales, whereas the private sector firms are able to immediately adjust pay levels upward in response to diminishing manpower supplies. The military found it easier to attract



women who have traditionally experienced discrimination in the private sector when competing with their male counterparts.¹⁹⁸ This has resulted in a significant increase in the number of women in the navy since 1975, as indicated in Table IV.

The trend toward an increased number of women in the navy can be expected to continue as the country's manpower has been marked by a low natural rate of growth (0.2 percent) and progressive aging.¹⁹⁹ Moreover, the new law concerning military service requirements obliges only one male per family to perform his military obligation. Thus, many men are no longer subject to the draft and are free to commence their careers.²⁰⁰ Consequently more males will be available to the free labor market and women will find it more difficult to compete, as has traditionally been the case. Therefore it seems logical that more women must be recruited if the navy is to maintain its current size.

Belgian women 18-30 years old are eligible to apply for naval service as long as they successfully pass the entrance and medical examinations and are not pregnant. The initial service obligation is two years and basic training is the same as their male counterparts with the exception of modified weapons handling since they will not be assigned fighting functions.

DAMARS are given priority in assignment to administrative services billets if they so desire. Pregnancy



TABLE IV

*DAMARS IN THE BELGIAN NAVY

<u>Date</u>	<u>Officers</u>	<u>Petty Officers</u>	<u>Seamen</u>	<u>Total</u>
JUN 1975	-	-	30	30
JAN 1977	-	-	153	153
DEC 1977	4	7	189	200
JAN 1978	4	7	212	223
OCT 1978	10	50	290	350

* DAMARS - Dames van de marine - women of the navy

SOURCES: "Reunion d'Information Force Navale," Part C: Personnel, p. 1.; "DAMARS: Objectief 1978," VOX: Militair Weekblad, (Vol. 4, No. 4, 8 December 1977), pp. 20-21.; Staf Chef van de Zeemacht Letter dated 12 October 1978, p. 1.

leave is granted or women may elect to depart the service. Additionally, a wide latitude of social considerations is also recognized for which leave may be obtained such as caring for infant children and similar family responsibilities.

DAMARS are still new in the armed forces and it will undoubtedly be several years before they are fully integrated into the navy. Similar to women in the United States Navy, those women who are the early pioneers in a traditionally all-male organization stand a good chance of making significant achievements as new avenues of opportunity are opened to them. However, it is unlikely that major shore commands and flag rank are realistic possibilities for a long time to come due to the small size of the Belgian Navy.

3. Personnel Shortages

The Belgian Navy is continually plagued by a serious shortage of personnel. The maximum peacetime strength of the navy is set by Parliament at 70 percent of the wartime complement. During the past two decades the navy, at approximately 4,400 personnel, has averaged five percent of the total armed forces strength. Paradoxically, the navy has consistently possessed more ships than it has been able to man. Admittedly it can be argued that all the available naval ships are not required to successfully execute the missions assigned, however, the high operating tempo of the fleet would indicate otherwise. Additionally, the number of ships in active service has been reduced to

provide personnel for the initial break-in period of the new frigates. Consequently, the fleet is tasked to accomplish the same number of missions with fewer assets.²⁰¹

During the early years of the Cold War the navy gradually increased from 8 to 45 minesweepers and escort-sweepers with the assistance of the United States under the MDAP and Off-Shore Procurement programs. At that time the navy averaged 4,800 personnel and found it too difficult to accomplish all the repairs, training, and mission requirements with such a small manning level. Modern techniques such as combining sweeping and hunting capabilities in a single mine countermeasures vessel provided the opportunity to reduce the number of ships without degrading mission capabilities.²⁰² Unfortunately, the number of authorized personnel also declined in proportion to an overall reduction in the armed forces, creating the same conditions obtained in the mid-fifties. The navy has constantly sought innovative measures to offset these reductions in personnel. For example, the rotational-ship system allows a smaller number of naval personnel and civilians the opportunity to execute maintenance and repairs more efficiently since they are free of the normal interruptions of berthing shifts, inspections, unanticipated operations, and short turn-around times associated with the operating fleet. However, if the navy decided that it was necessary to man all its available ships, approximately 1893 personnel would be required based upon published manning information.²⁰³



The Operations Command presently accounts for about 2,332 personnel (52 percent of the navy) with about 1,570 assigned to sea duty. COMPOSNAV would find it difficult to assign sufficient numbers of personnel to all units and still maintain its command and planning functions without an increase in its manpower authorization. Similarly, the other functional commands would find it equally difficult to provide personnel to the fleet at the expense of their mission requirements. Naturally, the requirements to man all fleet units would be contingent upon the outbreak of hostilities or some hypothetical national crisis requiring such a decision. The Naval Reserve consisting of about 5,500 personnel would be available in such a situation to bridge the gap, but only in the immediate future, as the reserve forces are dwindling. The Naval Reserve is expected to further decline due to the large reduction in numbers of conscripts assigned to the navy. A partial solution to this problem is the navy's ship acquisition program. The navy is again taking advantage of the latest state-of-the-art in naval warfare technology to build a smaller, more capable fleet which will require fewer personnel. Nonetheless, the present situation finds the navy too small to fully man its units and successfully accomplish all the planning, coordinating, and support functions required by the fleet.

After the initial trials and acceptance periods of the new frigates the navy will establish a rotation system

with two frigates in active service, one unmanned in ready reserve, and one in overhaul. This will free a large number of personnel to re-man those units which were placed in reserve to provide personnel for the frigate program.²⁰⁴

Recent government programs to reduce the burden of universal military service further complicate the personnel situation. The new law calls for, (1) a further reduction of the active duty obligation for conscripts to 11 months for officers and six months for all others; (2) requires that only one member per family must serve in the armed forces; (3) shortens the total military obligation to seven years; and; (4) encourages an increase in the number of women volunteers.²⁰⁵ The immediate effects of this program are a reduction in the number of conscripts assigned to the navy and a large reduction in the total number of citizens required to perform military service. The extremely short active service obligation also increases the administrative burden caused by rapid turnover of both active duty conscripts and the reserves. Furthermore, it is no longer cost-effective to train conscripts beyond the absolute minimum required to serve safely at sea. The long-term effect on the navy is a serious reduction of the Naval Reserve. Additionally, with the professionalization of the navy, the government plans to further limit the navy's total authorized strength.²⁰⁶ To compensate for the loss of personnel due to the ten month service obligation and reduction in numbers of conscripts an increase in volunteers

is authorized. The rationale behind the overall program is to provide a navy and total operational force with younger volunteers resulting in a stable quantity and quality of personnel in the navy.²⁰⁷

The burden of increasing the number of volunteers falls on the Naval Recruiting Program which has been barely capable of meeting its quotas to keep pace with the number of volunteers departing the navy. It is also interesting to note that, due to the more stringent selection criteria required by a modern, technologically oriented navy, and especially the requirements for sea duty, approximately 43 percent of the candidates for the navy fail their medical examinations. Additionally, the navy has found, like those of many other nations, that the overall quality of candidates has fallen.²⁰⁸

Evidently, the navy hopes to solve its personnel problems sometime in the mid eighties when all of the new trinational minehunters are received in the fleet. The increased capabilities of these ships combined with the reduced number of personnel required to operate them will allow the navy to cut the size of the fleet drastically. Provided the government does not radically reduce authorized personnel levels, the Belgian Navy should be able to overcome its personnel problems and continue to make a significant contribution to the allied ASW and MCM effort in the North Sea and English Channel area.

4. Unionsim in the Belgian Navy²⁰⁹

The navy has shared in the general atmosphere of dissatisfaction in the Belgian armed forces which gave birth to military unions in the early sixties. Moreover, any increased benefits or bargaining leverage which accrue to the union movement in the army would also benefit naval personnel. Owing to the uniqueness of navy life, and particularly to the routine of ships at sea, any revision of the conditions of service which does not take into consideration the particular character of a military service could have far-reaching consequences for the navy. Thus, the navy may be approaching the time when a forty-hour work-week, overtime for weekend duty, and compensation for night-time watches may be the norm.

Although military unions are six years old in Belgium, they have been officially recognized only since 1975. Despite the fact that government legislation is not complete, unions are growing and will undoubtedly develop into representative organizations with considerable negotiating power. How well a navy or the armed forces of a nation can continue to operate with such organizations is a question in the minds of many military planners throughout the free world. The answer to that question is beyond the purpose and scope of this discussion which will simply highlight the evolution and current status of unions in the Belgian Navy.

a. The Evolution of Military Unions

Prior to World War One the military profession in Belgium enjoyed a relatively enviable status. At each level of the social hierarchy the armed forces occupied a privileged position. Officers in general belonged to the nobility or the bourgeoisie; however, they did not form a social class but rather operated as a caste system. Even lower ranking professional soldiers were proud of their status and aware that they belonged to a principal organization of the state. In general, they were satisfied with the military service and content in the high esteem provided them by the citizenry.

During the interwar period a large number of ex-servicemen who had fought in the 1914-1918 war formed a large, powerful, and highly organized section of the electorate. They were respected citizens because of the years they had spent defending their country at great personal risk. The nation paid its debt to these men by the creation of disability pensions and preferential employment in public service. Veterans occasionally drew up additional demands for disability benefits and pensions. Many of these were militantly expressed with public demonstrations to obtain the support of the population and eventual passage into law.

The situation after World War Two was quite the opposite, due largely to the forced surrender of the army in 1940. At one fell swoop the armed forces lost the

prestige they had acquired during their long history dating back to 1830. The nation was in turmoil due to the charges and counter-charges of collaboration during the war. The Belgian Royal Question was but one of the manifestations of the agony which the nation endured for several years following the cessation of hostilities. In essence, Belgium entered a new age dominated by many new ideas which were totally contrary to pre-war values. Not only was the military discredited, even the monarch was verbally assaulted in an unprecedented fashion and finally forced to abdicate in 1951. Due to the requirements of the Second World War the influx of personnel from all sectors of society diluted the dominance of the military by the nobility and bourgeoisie. The esprit de corps necessary for a united front by the military no longer existed.

The prevailing public attitudes were reflected in Parliament's failure to provide the level of benefits, disability payments, and pensions which the veterans deemed appropriate to their sacrifices.²¹⁰ Furthermore, the armed forces were chagrined by the progressive reductions of the active service obligations of conscripts to 18 and 12 months, respectively, in 1954 and 1956. However, military discipline was still sufficient to discourage open militancy by its members.²¹¹

Around 1960 these factors coalesced with "a worsening explosive psychological atmosphere about which the press made a lot of fuss, talking about the 'sickness in the

army'." ²¹² Newspaper accounts continually ridiculed the army, especially the officer corps, yet no attempts were made either by the Minister of Defense or senior officers to reply to their critics. Pride and morale in the armed forces, particularly the officer corps, were seriously damaged. Many military men still believed they were "the elite of the national elite as far as courage, intelligence, and a sense of civic responsibility were concerned."²¹³

During this same period of time the Minister of Defense, A. Gilson, and the President of the Committee of the General Staff, Lieutenant General Baron Jacques de Dixmude, disagreed over military reforms initiated by Gilson. The general was distressed by the reductions in military appropriations and a further proposed reduction in the length of military service. The Minister of Defense was further castigated for not replying to the critics of the army. General de Dixmude made a spectacular gesture by retiring before reaching the age limit; albeit a gesture which was generally ignored by a disinterested public. Nonetheless, the general's brother, an army colonel, founded the Association des Officiers en Service Actif (AOSA) in 1961. The association was ostensibly a charitable organization, since disciplinary regulations forbade military men to join any organization which had political characteristics

or tendencies. The avowed objective of the AOSA was to "revalue the army in public opinion."²¹⁴

Since then the AOSA, which began as a basically idealistic endeavor to regain the army's lost prestige, has been transformed into a primarily materialistic military union active in all of the armed forces. However, it must be noted that the evolution of military unions in Belgium is far from complete as the Parliament has yet to approve the legal constitution of the unions. This failure to approve a constitution for the military unions, three years after opening union membership to the military, is largely due to the unresolved questions concerning political affiliation between unions and political parties. Several years ago one of the unions concluded an agreement with the Liberal Party. Other parties were fearful of a great increase in the Liberal Party's influence due to this affiliation to a military union. The implications of such affiliations, added to the possibility that inexperienced servicemen and women could be exploited by extremist parties, is being studied prior to voting on the proposed legal constitution.²¹⁵

b. Current Status and Purpose of Military Unions

On 14 January 1975 the Law Concerning the Regulation of Discipline in the Armed Forces was promulgated. This law allows all military personnel, with the exception of members of the Gendarmerie, to affiliate themselves to a political party of their choice and grants permission to join one of the unions recognized by the military and the government.²¹⁶

As a result of the new law, the men and women of the armed forces may join one of the two recognized associations for military personnel, or those trade unions which are recognized as representing personnel in the civil service. Although article 30a of the same law prohibits strikes by military personnel, the only punishment for coming out on strike is limited to "solitary confinement, outside normal working hours, in a secure place," for not more than eight days.²¹⁷ The most powerful weapon of a union is the right to strike; one can imagine the difficulty of enforcement of the no-strike rule should widespread dissatisfaction occur within the armed forces.

As previously mentioned, material aspects now dominate the concerns of the unions. Their demands primarily concern pay and benefits, conditions of service, overtime remuneration, and the right to be informed concerning measures contemplated by the government. Included in these demands is the possibility of negotiations in order to reconcile any conflicting viewpoints concerning policy and regulations.²¹⁸ The Minister of Defense actively consults the leaders of the unions on all matters concerning personnel. Unions may conduct official business with only the Minister of Defense; official contact with the military hierarchy is prohibited.²¹⁹ Total union membership for the armed forces has steadily increased from about 25 percent in 1972 according to Werner. The military services do not



maintain statistics on union membership and no estimate was offered in response to queries by this writer.²¹⁹

Aside from the questions concerning political party-union affiliation and strikes the unions seem to be working as well as can be expected of any new organizations. No real tests of power have yet occurred and the Belgian government and Defense Ministry want to avoid any such contests of will. Since union membership is still relatively new it is difficult to assess its effects upon the navy. This is particularly true in light of the fact that social legislation plays a prominent role in Belgian society. How well the navy accomplishes its missions in the face of future union demands will depend to a large degree upon the leadership in the petty officer and officer corps. The professionalization of the navy might be the key to keeping union demands within bounds that allow the navy to function. Excessive demands could place intolerable constraints on the navy's training and operational capabilities. However, as in the Netherlands, West Germany, and a number of other countries, military unions are becoming a way of life in Belgium. Only the test of time will prove the merits of such organizations in the country's armed forces.

D. NAVY FINANCES

The armed forces priority on the national budget remains traditionally low. Immediately following World War

Two the government cut the size of the army and planned to maintain the new navy and air force at minimum strenghts. The reconstruction of the nation and its national economy was the driving force behind these moves and afforded scant opportunity to modernize the armed forces.

The nation's commitment to collective security organizations such as the Brussel's Pact in 1948 and NATO in 1949 resulted in the obligation to enlarge the military services. Furthermore, the armed forces had to be equipped with material comparable to those of its alliance partners in terms of modernization and in terms of burden-sharing proportional to the size of the national economy.²²¹

The outbreak of the Korean War provided the second impetus to enlarge the armed forces and witnessed the doubling of the defense budget between 1949 and 1952. The defense appropriations in 1949 were 9.8 percent of the national budget. They increased to a high of 19.9 percent in 1952. The priority of the armed forces rapidly declined with the thaw in the Cold War and its resultant diminished propsects of confrontation between East and West. Defense budgets were continually reduced from 1952 through 1976 except for the period 1962-1964 when the need of new equipment resulted in major expenditures to modernize the armed forces once again.²²²

Since 1976 the defense expenditures of Belgium have remained stable at 7.1 percent of the national budget. During the past decade defense expenditures averaged

between 3.0 and 3.5 percent of the nation's gross national product. Ranked alongside her NATO allies, Belgium consistently holds the tenth or eleventh position for defense expenditures as a percent of the gross national product. Nevertheless, since 1967 the defense budget has experienced an average yearly increase of 4-5 percent. The total defense budget currently averages about \$2 billion.²²³

The armed forces also receive supplemental appropriations, not included in the budget, to execute specific programs such as the European Defense Improvement Program (EDIP), the program to return two brigades from West Germany to Belgium, and the professionalization plan in the armed forces under the latest selective service laws.²²⁴

1. The Navy's Operating Budget

The navy receives two annual appropriations designated the Ordinary Budget and the Extraordinary Budget, plus supplemental appropriations for infrastructure expenses and special programs. The Ordinary or Operating Budget covers the expenses of personnel and all routine expenditures associated with operating the fleet. This budget has averaged about five percent of the defense budget since 1952. The current Operating Budget averages around \$100 million annually.²²⁵

Personnel salaries and wages account for nearly 50 percent of the navy's operating expenses. Military pay in Belgium, as in most other Western nations, represents

an ever increasing portion of the navy's budget. In an effort to stem the rising personnel costs the government initiated the armed forces professionalization plan to provide the nation with a smaller more capable military establishment which would be more cost-effective.

The remainder of the Operating Budget after personnel expenses is apportioned between the ASW and MCM missions areas and other defense tasks of the functional commands. The MCM forces normally receive the largest share of operating funds, however, that is likely to change in favor of the frigates since they are more costly to operate and maintain. Moreover, the MCM forces have already undergone several modernization and improvement programs during the past several years using Investment Budget funding.

2. The Navy's Investment Budget

The Extraordinary or Investment Budget is appropriated primarily for major maintenance, fleet modernization, construction of new facilities, and ship acquisition programs. This budget varies from year to year depending upon the number and scope of authorized programs. During recent years the budget has been quite large to provide for the frigate and MCMV construction programs.

The navy, the smallest armed force, has always received the smallest share of the defense budget and will undoubtedly continue to do so. Nonetheless, the navy has

always managed to gain sufficient support for its ship acquisition programs throughout its history. In the early fifties the navy received an entire fleet of MCM vessels; two new mine countermeasures command and support ships in the mid-sixties; four frigates in the mid-to-late seventies and; approval for ten minehunters in the eighties. Although the government seems to maintain the traditional preference for a small navy, it has nonetheless, provided the navy with the latest, if not the best, equipment and ships during the past 25 years.

The frigate program represents an investment of \$150 million to Belgium and provides the navy with the means to execute a traditional mission area which it has not been able to accomplish since the decommissioning of the Algerine class escort minesweepers in the sixties.²²⁶ Perhaps equally important to the nation was the stimulation to the shipbuilding industry in terms of sophisticated technology and a new capability to build major warships. The shipbuilding industry also hopes to attract foreign buyers. Consequently this investment program has more than purely military benefits to the navy.

Likewise, the new trinational minehunter program involves an investment of around \$50 million which will benefit both the navy and Belgium's economy. The participating nations have equitably distributed the manufacture of various systems between them. Belgian industry is responsible for the electronic propulsion systems and all

associated components for the entire class of ships. A minimum of 40 vessels is already agreed upon plus options to significantly increase that number.²²⁷

In general, the navy Investment Budget, although a fraction of that of the other services, has managed to keep pace with the navy's mission requirements, even if in a somewhat belated and constrained fashion compared to the rest of the armed forces. The frigate program was belated and constrained and the ASW mission area was neglected for almost a decade while the navy fought for approval of the program, and the final design characteristics of the ships were primarily cost-dictated despite pronouncements to the contrary.

3. Supplemental Appropriations

The navy also receives an annual stipend to cover the costs of its infrastructure. Expenditures are made primarily for modernization and construction at existing facilities. Construction of new bases comes under the investment budget after which time maintenance is provided under these supplemental funds.

The expenses of the navy to provide services and facilities to NATO forces, such as communications or harbor facilities also comes under supplemental appropriations. This is a small budget item and represents only about one million dollars a year.²²⁸



VI. CONCLUDING REMARKS

The preceding chapters have acquainted the reader with the Belgian Navy by way of a detailed description of the navy's background, development and current status. At this point a brief comparison with NATO and the Soviet Union's naval forces may help to place the Belgian Navy in perspective.

Several problems become apparent immediately when comparing the Belgian Navy to those of its allies. The size and composition of the Belgian fleet are determined by the missions described in Chapter III. Belgium, as shown in Table V, maintains the smallest navy in NATO and is the smallest nation with respect to land area. Furthermore, a glance at any map of NATO nations indicates that Belgium's coastline is also the shortest. Although the Netherlands is most similar to Belgium with regard to land area, population, location, and economy, a significant difference between these two sister nations is the length of their coastlines, shorelines, and borders. The coastline of the Netherlands is more than six times that of Belgium, while the many indentations of the Dutch landmass provide an even greater shoreline. (See Map 2) Additionally, the depths of the North Sea are greater in the Netherlands' coastal area than in Belgium's sector of responsibility.²²⁹ Hence, the Royal Netherlands Navy faces a greater submarine

TABLE V

SELECTED STATISTICS - NATO NAVY COUNTRIES

COUNTRY	NAVY	ARMED FORCES	DEFENSE ^a BUDGET	GNP ^b	GNP ^c PER CAP	AREA ^d	POP ^e
BELGIUM	4,200	85,650	1.82	66.5	5,851	11,779	9.90
DENMARK	5,800	34,700	1.08	34.2	6,245	17,018	5.07
NORWAY	9,000	39,000	1.10	31.1	5,928	125,340	4.03
PORTUGAL	12,800 ^f	42,000	0.46	15.8	1,463	35,340	9.45
CANADA	13,400 ^g	80,000	3.61	175.3	5,838	3,851,804	22.99
NETHERLANDS	17,000	109,700	3.36	85.1	5,345	14,192	13.77
GREECE	17,500	200,000	1.10	22.7	2,208	50,547	9.17
WEST GERMANY	38,000	489,000	13.76	449.1	6,029	95,815	61.50
ITALY	42,000	330,000	4.64	161.6	2,759	116,303	56.19
TURKEY	43,000	465,000	2.65	40.2	553	301,380	40.16
FRANCE	68,000	502,000	11.72	353.2	5,638	211,000	52.92
UNITED KINGDOM	72,000	339,150	10.88	224.5	3,684	94,209	53.93
UNITED STATES	520,992	1,970,587	104.30	1,766.0	6,441	3,608,672	216.80

Notes:

- a - 1977, US\$ Billions
- b - 1976 estimated GNPs, US\$ Billions
- c - 1976 estimated GNP per capita, US\$ Billions
- d - area in square miles
- e - 1977 estimated population in millions
- f - The navy is being reduced to 8,000
- g - The Canadian Armed Forces were unified in 1968, the strength shown for the navy is only approximate

SOURCES: The Military Balance - 1977-1978, pp. 4-28.; The World Almanac and Book of Facts, pp. 497-589.



THE BENELUX NATIONS



SOURCE: F. Gunther Eyck, The Benelux Countries: An Historical Survey, (Princeton: D. Van Nostrand, 1959), p.1.

threat, in addition to a mine threat, in a much larger area of territorial and coastal waters. Deeper waters permit the use of submarines against the Netherlands' North Sea lines of communications, but they also allow the Royal Netherlands Navy to possess and operate submarines. Belgium, on the other hand, lies along coastal and approach routes which are too shallow for modern submarines. Belgian harbors are also too shallow, and they are guarded by many hazardous sandbanks. Therefore, submarine operations along the Belgian coast, if not impossible, would result in greater danger and risk to the submarines than to their intended prey. This all goes to say that the missions of the Dutch and Belgian Navies are determined by basically geographic features such as proximity to a particular threat, length of coastline and shoreline, depth of water, and so on. Therefore, as indicated in Tables V and VI, the Royal Netherlands Navy is larger, composed of more frigate-type vessels to counter the larger threat of submarine warfare, and possesses a small number of submarines. The larger coastal area, the physical characteristics of its surrounding waters, and the shape of its landmass have dictated the need of a larger navy for the Netherlands. Likewise, the physical features of Belgium's coast and waters have dictated the size and composition of its navy. For the sake of completeness, it should be noted that the size of the armed forces of Belgium and the Netherlands are also a reflection of spacial considerations, physical

TABLE VI

SUMMARY OF GENERAL PURPOSE NAVAL FORCES - 1977

<u>COUNTRY</u>	<u>VESSEL TYPE</u>							<u>TOTALS</u>
	<u>MCM</u>	<u>SUPPORT</u>	<u>PATROL^a</u>	<u>FRIGATE^b</u>	<u>SUBMARINE</u>	<u>AMPHIBIOUS^c</u>	<u>CARRIER</u>	
BE	27	4	7	4	-	-	-	42
DEN	8	-	37	10	6	-	-	61
NOR	10	-	52	7	15	7	-	91
PORT	7	-	18	17	3	2	-	47
CAN	-	3	6	23	3	-	-	35
NL	37	2	5	23	6	-	-	73
GK	14	-	24	15	6	-	-	59
WG	57	11	40	22	24	18	-	172
IT	44	-	5	27	8	2	-	86
TUR	25	-	65	14	14	22	-	140
FR	38	-	32	44	21	2	2	139
UK	34	-	11	72	27	47	-	191
USA	3	85	3	167	121	65	13	457
TOTALS:	302	105	305	445	254	165	15	1591
USSR	365	768 ^e	616	228	335	82	2 ^d	2396

Notes:

a - includes patrol escorts, coastal, river and torpedo patrol boats.

b - includes cruisers, destroyers, destroyer-escorts, frigates, and corvettes.

c - includes command and control, and landing ships.

d - The two Kiev class ASW cruisers of the Soviet Navy are often considered as a type of carrier, and for this comparison, recorded as such.

e - only 90 of these vessels are over 2,500 tons

SOURCE: The Military Balance, pp. 1-28.

features, and threat expectations. The Belgian Army and Air Force, like those of the Netherlands, are considerably larger than the navy because the eastern border of both countries is the traditional route of invasion. Whether or not this represents a land war mentality is difficult to assess. Certainly the historical experiences of these two nations must have a significant influence upon the structure and composition of their total armed forces. However, the composition and minimum strengths of Belgium's Armed Forces are closely tied to membership in the NATO alliance and the concept of burden sharing whereby members agree to maintain their armed forces at agreed upon levels.²³⁰ Therefore, if a land war mentality can be said to exist, it does not do so only in Belgium as evidenced by the armed forces strengths of all those nations along the NATO Central Front which has been the traditional battleground of Europe.

All factors considered, Belgium does not expect an attack or invasion from the coast, surrounded as she is by the navies of France, Britain, the Netherlands, and West Germany. The threat from the sea for Belgium lies in the vulnerability of its sea lines of communications either from coastal mining or submarine operations in the Western Approaches to the English Channel, the North Sea, and the Baltic. The greatest threat lies not in the crowded Channel or Southern North Sea, but rather in their outlying approaches at a distance from Belgium's coast where hostile

submarines would be able to interdict the sea lines of communications. Naturally, the mine threat would be great within Belgium's immediate coastal area due to the ease and speed of aerial minelaying techniques. Therefore, Belgium must possess a navy which can counter the mine threat in the immediate area of her coast and also help strengthen the assets of Belgium's allies who guard over the approaches and chokepoints of the larger North Sea-English Channel area.

It is obvious that the Belgian Navy is too small to defend itself, let alone Belgium, but today that is also true of her neighbors. It is apparent from Table VI that no single nation, not even the United States, possesses sufficient numbers and capabilities to defend against all possible Soviet threats.²³¹ Nonetheless, within the NATO naval structure the Belgian Navy possesses sufficient numbers and capabilities to ease the burden of its allies and to participate as a full partner in the common defense. Without a navy Belgium would have no voice in the maritime defense of its coast and waters. With a navy Belgium provides additional numbers of ships to a NATO naval force already outnumbered by Soviet naval forces, and it secures an active role in the vital decision making process affecting maritime defense.

A note of caution is warranted. As previously mentioned, a list of numbers cannot adequately indicate the strength of a naval force. Inadequate repair, maintenance, overhaul schedules, and lack of expertise can significantly reduce

the effectiveness of available ships during any given time period. The education and training, and cooperation between naval personnel also plays a major role in successful naval operations. As stressed throughout this paper, one of the Belgian Navy's most important and valuable contributions to NATO has been its catalytic role in fostering joint education, training, cooperation, planning and integration in NATO, all of which springs from the country's total dedication to collective security as embodied in the alliance. In this respect, the Belgian Navy could be called the Belgian NATO Navy. It is totally dedicated, oriented, and organized to operate as part of the NATO naval structure. If this were not true, the Belgian Navy could be reduced in size to accomplish only its national missions. Such a reduction, although unthinkable, would place the burden of Belgium's maritime defense upon her allies. Fortunately, Belgium recognizes that a small, properly equipped and well trained navy can and does enhance the overall defense of Western Europe. Moreover, a closer look at Table VI indicates that most of the navies in NATO are small. However, the whole is greater than the sum of its parts. When one subtracts the naval units of the United States, Canada, France, Italy, Turkey, Greece, and Portugal which are not actually available in the North Sea-English Channel area, the limited numbers of the Belgian fleet loom large and become extremely important.

Who cares about the Belgian Navy? Every nation with an interest in the maritime defense of Northern Europe should care. Fortunately, many do, as evidenced by the growing levels of cooperation, joint construction programs, and integration of naval units with the Belgians. Every new addition to the Soviet fleet makes it more difficult for the Atlantic Alliance to ensure protection of its merchant fleets. Similarly, every addition to the small navies of NATO helps to off-set Soviet increases, especially when the highest levels of Western technology are incorporated into these vessels.

Although comparisons of the Belgian Navy can be made with the navies of Norway, Denmark, Portugal, West Germany, and so on, in each case the variables of location, length of coastline and shoreline, water depth, and proximity to a particular threat are the determinants of the size and composition of each of these navies. If one takes only the above factors into consideration, the Belgian Navy is, in relation to them, the largest open ocean navy in the world. No other navy possesses as many ships as Belgium relative to the above factors. However, the Belgian Navy is designed to operate in a larger context than dictated by its immediate coastal responsibilities. It is designed to operate as a coastal defense force and in any other area required by integrated NATO naval commands.

If the Belgian Navy was designed solely as a coastal defense force, it could be smaller and could concentrate

only on mine warfare with some type of coastal patrol craft to provide air and surface protection to the MCM fleet. This type of single-minded specialization would provide no ASW or escort capability, and Belgium would be forced to rely upon its allies for protection of its merchant fleet and maritime trade. Some military planners believe that specialization of this type could help the smaller NATO countries maintain a meaningful defense effort with limited resources.²³² Specialization could, however, become a rationale for doing less while leaving large gaps in the overall defense of Western Europe. It would almost certainly result in a further reduction in fleet sizes and capabilities. As previously mentioned, the Belgian Navy is traditionally known for its mine warfare expertise. The recent addition of ASW-escort frigates was looked upon in some quarters as a shift away from specialization which might lead to a degradation of the MCM capability. As this paper has attempted to show, nothing could be further from the truth. The Belgian frigates actually strengthen the MCM capability by providing protection to the MCM fleet while restoring the navy's ability to help protect its merchant fleet from surface and subsurface threats. Anti-submarine warfare and convoy escorting are not new missions for the Belgian Navy, but longstanding missions which were never adequately accomplished in the past. The renewed, if limited, capability provided by the frigates augments the assets of Belgium's allies

and must be looked upon as a significant contribution to the common defense. Any fears that Belgium might diminish her MCM specialization should be dispelled by the navy's enthusiasm and cooperation in the Trinational Minehunter Program.

Belgium's extremely heavy reliance on maritime trade, its location abreast the world's most heavily travelled sea routes, its participation in many international organizations and treaty obligations, dictate the need for a capable navy to execute its responsibilities as a coastal nation. Anything less than a small war-fighting navy would diminish Belgium's role in decision-making forums which are vital to her national interests.] Throughout her history, Belgium has been a small economic power of considerable importance.] One can only guess what might have been, had Leopold I obtained a strong navy during Belgium's formative years. Seapower is no less important today but fortunately, Belgium recognizes that fact as indicated in the remarks of the Minister of Defense in 1967 when he said, "when the nation is a strongbox then the merchant marine and the navy are the keyhole and key."²³³

Today Belgium possesses a small, yet strong key for its door. That key is the Zeemacht-Force Navale. It deserves greater recognition and acknowledgement from all students of maritime affairs.

APPENDIX A
THE BELGIAN NAVAL FLEET

FRIGATE SQUADRON 181

F-910	Wielingen	Displacement:	2,340 Tons
F-911	Westdiep	Length :	106.4 Meters
F-912	Wandelaar	Beam :	12.3 Meters
F-913	Westhinder	Draft :	5.5 Meters
		Speed :	28 Knots
		Crew :	14 Officers 146 Enlisted

Weapons Systems

Sonar SQS 505a (Canadian)

Bofors Rocket Launcher - 375 MM - 6 tubes

2 Torpedo Launchers L5 Built in Belgium
1974-1977.

1 Sea-Sparrow Launcher

4 Exocet Missiles

1 100mm Multipurpose Gun

MINE COUNTERMEASURES FLOTILLA 22

Mine Countermeasures Support and Command Ships - MCSC

A-960	Godetia	Displacement:	2,500 Tons
A-961	Zinnia	Length :	100 Meters
		Beam :	14 Meters

Weapons Systems

		Draft :	3.6 Meters
--	--	---------	------------

Goedeia:	4 - 40MM guns in two twin mounts.	Speed :	18 Knots
		Crew :	10-13 Officers 110-124 Enlisted

Zinnia:	3 - 40MM gun mounts.	Built in Belgium	1965-1967.
---------	-------------------------	------------------	------------

SOURCES: "Operationele Richtlijnen Voor 1977," Krijgsmacht, Generale Staf, Staf van de Zeemacht, Sectie Operaties, 1977, pp. I-1 - I-2. "Familieportret," VOX: Militair Weekblad, (Vol. 3, No. 33, 23 September 1976), pp. 15-19. P.P. Vande Sande, "Familieportret," VOX: Militair Weekblad, (Vol. 2, No. 18, 15 May 1975), pp. 7-10. "The Means Available to Accomplish the War-time and Peace-time Tasks of the Belgian Navy," pp. 1-15.

APPENDIX A

FLOTILLA 22 (Cont.)

Ocean Minesweeper Squadron 191 - MSO/MHSO

M-902	Van Haverbeke	Displacement:	800 Tons
M-903	Dufour	Length :	52.7 Meters
M-904	DeBrouwer	Beam :	10.7 Meters
M-906	Breydel	Draft :	3.2 Meters
M-907	Artevelde (Diving Vessel)	Speed :	14 Knots
M-908	Truffaut	Crew :	5 Officers 67 Enlisted
M-909	Bovesse		

Built in the USA between 1955
and 1960.

Capabilities

All units except M-907 will have the SQQ 14 variable depth sonar and 2 PAPs by 1980. All units will retain the mechanical minesweeping capability.

Weapons

All units except M-903 are equipped with 1 - 40MM single mount gun. Minesweepers and minehunters are not designed with self-protection in mind, but rather a weapon which can be used to destroy swept moored mines.

Coastal Minesweeper Squadron 124 - MSC/MHC

M-928	Stavelot (MSC)	Displacement:	300 Tons
M-930	Rochefort (MSC)	Length :	44 Meters
M-932	Nieuwpoort (MSC)	Beam :	8.3 Meters
M-933	Koksijde (MSC)	Draft :	2.6 Meters
M-934	Verviers (MHC)	Speed :	14 Knots
M-935	Veurne (MHC)	Crew :	4 Officers 38 Enlisted MHC - 4 Officers 34 Enlisted

Capabilities

MHC - Minehunting
with MK 193
Sonar and 2
PAPs.

Built in Belgium 1953-1955 .
except M-934 and M-935 which
were built in USA 1956-1957.

MSC - Minesweeping
with magnetic,
acoustic or
mechanical gear.

Weapons

1 - 40MM gun mount



APPENDIX A

FLOTILLA 22 (Cont.)

Inshore Minesweeper Squadron 219 - MSI

M-474	Turnhout	Displacement:	190 Tons
M-475	Tongeren	Length :	34.5 Meters
M-476	Merksen	Beam :	6.7 Meters
M-477	Oudenaarde	Draft :	2.1 Meters
M-482	Vise	Speed :	15 Knots
M-483	Ougree	Crew :	1 Officer
M-484	Dinant		16 Enlisted

Built in Belgium 1955-1957.

Capabilities

Minesweeping with magnetic, acoustic, or mechanical gear.

Weapons

2 - 50 caliber Machine Guns

The following fleet units are under the direct operational command of COMOPSNV and are administratively assigned to various shore Naval Commands:

Inshore Minesweeper Squadron 218 - MSI

Division 218.1

M-471	Hasselt	Characteristics: Same as
M-472	Kortrijk	Squadron 219
M-478	Herstal	Duties: Ready Duty Ships (RDS), Research and Surveys.

NAVCOMOST is the administrative commander.

Division 218.2

M-473	Lokeren	Characteristics: Same as
M-479	Huy	Squadron 219
M-480	Seraing	Duties: Reserve Training
M-485	Andenne	NAVCOMANT is the administrative commander.

APPENDIX A

River Patrol Squadron 217 - PBR

P-901	Leie	Displacement:	27.5 Tons
P-902	Liberation	Length :	25 Meters
P-903	Meuse	Beam :	3.8 Meters
P-904	Sambre	Draft :	0.9 Meters
P-905	Schelde	Speed :	19 Knots
P-906	Semois	Crew :	7 Enlisted

Built in West Germany 1953-1954.

Weapons

2 - 50 Caliber
Machineguns

NAVCOMANT is the administrative commander.

AUXILLIARY UNITS

A-958	Zenobe Gramme	28 meter Bermuda Ketch used for sail training and ocean research. Crew: 2 officers, 7 enlisted
A-962	Mechelen	Former MSC converted to hydro-graphic research vessel.
A-963	Spa	Former MSC being converted to a torpedo/missile recovery vessel.
A-964	Heist	Former MSC being converted into a degaussing control vessel.

7 auxilliary harbor and yard craft assigned to the various Naval Commands.

The New Trinational Minehunter

When completed, the new MCMVs will have the following characteristics:

Displacement:	510 Tons
Length :	51.6 Meters
Beam :	8.9 Meters
Draft :	2.45 Meters
Speed :	15 Knots
Crew :	6 Officers 42 Enlisted
Weapons :	20 mm gun mounts.
Capabilities:	Fully automatic minehunting system.

FOOTNOTES

1. L. Leconte, Les Ancestres de Notre Force Navale, (Bruxelles: Etablissements Pauwels Fils, 1952), p. 23.
2. L. Leconte, De Voorouders van Onze Zeemacht, Ministerie van Landsverdediging, Dienst voor Opvoeding bij het Leger, (Brussel: 1948), pp. 6-12.
3. Leconte, Les Ancestres de Notre Force Navale, p. 26.
4. Leconte, De Voorouders van Onze Zeemacht, pp. 5-7.
5. Leconte, Les Ancestres de Notre Force Navale, p. 18. During the 31 years of its existence, the Royal Belgian Navy was shuffled back and forth between the ministries of foreign affairs and public affairs until it came to rest with the Railroad Administration just prior to its abolition in 1862. During the course of these wanderings documentation was scattered and large quantities of records were lost. The two works by Leconte are the only definitive histories of the Belgian Navy's ancestors.
6. Leconte, De Voorouders van Onze Zeemacht, p. 6.
7. J. Gleissner, "Belgie: Kleine Zeemogenheid: Eerste Eenheden Waren 'Afdankertjes,'" Gazet van Antwerpen, 30 December 1966, p. 1.
8. William L. Langer, An Encyclopedia of World History, (Boston: Houghton Mifflin, 1972), pp. 672-673.
9. Gleissner, "Belgie: Kleine Zeemogenheid: Eerste Eenheden Waren 'Afdankertjes,'" p. 11.
10. Jan-Albert Goris, Belgium, (Los Angeles: University of California Press, 1946), pp. 35-36. Although dated, this volume is still considered one of the best books written on the history of Belgium.
11. Leconte, De Voorouders van Onze Zeemacht, pp. 5-6.
12. Ibid., pp. 6-10.
13. Goris, Belgium, p. 42.
14. Leconte, Les Ancestres de Notre Force Navale, pp. 135-146.



15. Leconte, De Voorouders van Onze Zeemacht, p. 12.
16. Leconte, Les Ancestres de Notre Force Navale, p. 12.
17. J. Gleissner, "Belgie: Kleine Zeemogenheid: Koninklijke Marine Werd Door Politieke Landrotten Gekelderd," Gazet van Antwerpen, 31 December 1966, p. 1.
18. Goris, Belgium, pp. 46-47.
19. De Belgische Zeemacht, Dienst Informatie van de Zeemacht, (Brussel: Drukkerij Rossel, July 1965), p. 1. Author's translation of "Geen enkel Land is Klein, Wanneer het Raakt aan de Zee."
20. Leconte, De Voorouders van Onze Zeemacht, pp. 14-16.
21. F. Gunther Eyck, The Benelux Countries: An Historical Survey, (New York: D. Van Nostrand, 1959), p. 75.
22. Leconte, De Voorouders van Onze Zeemacht, pp. 13-14.
23. Eyck, The Benelux Countries: An Historical Survey, p. 74.
24. Goris, Belgium, p. 52.
25. J. Gleissner, "Belgie: Klein Zeemogenheid: De Marine was Steeds het Zwart Schaap." Gazet van Antwerpen, 3 January 1967, p. 1.
26. Leconte, De Voorouders van Onze Zeemacht, pp. 17-19.
27. "History of the Belgian Navy," Staf van de Zeemacht, Public Relations Dienst, (Brussel), p. 1.
28. Gleissner, "Belgie: Kleine Zeemogenheid: De Marine was Steeds het Zwart Schaap," p. 1.
29. De Belgische Zeemacht, p. 11.
30. Leconte, De Voorouders van Onze Zeemacht, p. 21.
31. Gleissner, "Belgie: Kleine Zeemogenheid: De Marine was Steeds het Zwart Schaap," p. 1.
32. Leconte, De Voorouders van Onze Zeemacht, pp. 22-23.
33. Goris, Belgium, pp. 130-134.



34. Henri Anrys, Conge Pour Mourir: Les Belges Dans La Guerre Navale 1939-1945, (Bruxelles: Pierre De Meyere, 1975), p. 33.
35. P. P. Vander Sande, "Waarom Een Zeemacht?," VOX: Militair Weekblad, (Vol. 2, No. 18, 15 May 1975), p. 2. This quasi-naval organization is variously referred to as the State Navy, the State Marine, the Marine Corps, and the Maritime Affairs Administration.
36. "Welkom aan boord A 961 Zinnia," Staf van de Zeemacht, Public Relations Dienst, (Oostende: Drukkerij De Vuurtoren), pp. 6-7.
37. J. Gleissner, "Belgie: Kleine Zeemogenheid: Eindelijk een Volwaardige Navy," Gazet van Antwerpen, 4 January 1967, p. 1.
38. Ibid., p. 1.
39. De Belgische Zeemacht, pp. 11-13.
40. Leconte, De Voorouders van Onze Zeemacht, pp. 26-18.
41. Gleissner, "Belgie: Kleine Zeemogenheid: Eindelijk een Volwaardige Navy," p. 1.
42. History of the Belgian Navy, p. 2.
43. Anrys, Conge Pour Mourir, pp. 51-52. This is the only complete history of the establishment and operations of the Royal Navy Section Belge.
44. De Belgische Zeemacht, p. 13.
45. Anrys, Conge Pour Mourir, p. 69.
46. Ibid., pp. 72-73.
47. "Een Terugblik Op...Royal Navy Section Belge," Staf van de Zeemacht, Public Relations Dienst, (Brussel), p. 1.
48. Anrys, Conge Pour Mourir, p. 77.
49. "Een Terugblik Op...Royal Navy Section Belge," p. 1. The Mercator had been on a training cruise when the war broke out and returned to England after a short port visit to the Belgian Congo.
50. Leconte, De Voorouders van Onze Zeemacht, pp. 27-18.
51. Anrys, Conge Pour Mourir, p. 79.

52. De Belgische Zeemacht, p. 13. Unfortunately, Lt. Billet never lived to see the RNSB become the Belgian Navy. He was listed as missing in action during an amphibious raid at Dieppe on 19 August 1942. The RNSB greatly mourned his loss and the Belgian Navy has remembered his sacrifices by naming a corvette and the naval barracks at Brugge, LT. BILLET.
53. Anrys, Conge Pour Mourir, pp. 85-89.
54. "Een Terugblik Op...Royal Navy Section Belge," p. 1.
55. "Welkom aan boord A 960 Godetia," Neptunus, (Brussel: E. Van Haverbeke, 1971), p. 8.
56. Anrys, Conge Pour Mourir, pp. 279-297. Anrys provides a full account of the operations and history of Belgian participation in Flotilla 118, and reminds his reader that each of these unsung heroes of the fleet was affectionately called a "Mickey Mouse." The ships, manned by two officers and 18 crewmen, were little more than large yachts which executed the dangerous minesweeping missions to ensure the safety of the larger combatants and merchant ships. After 1942 Belgian manned MMS-type minesweepers operated out of Harwich in the most heavily threatened sector of the North Command which included also the control of the Thames River mouth.
57. "Een Terugblik Op...Royal Navy Section Belge," p. 2.; "Welkom aan boord A 960 Godetia." Godetia was attached to the Eastern Task Force which led the first invasion convoy to the Normandy coast.
58. De Belgische Zeemacht, pp. 17-18.
59. Anrys, Conge Pour Mourir, pp. 443-445.; De Belgische Zeemacht, p. 18.
60. De Belgische Zeemacht, p. 18.
61. E. Ramon Arango, Leopold III and the Belgian Royal Question, (Baltimore: Johns Hopkins Press, 1961). This is an exhaustive study of the events dealing with the Belgian Royal Question beginning with the 18-day battle prior to Leopold's surrender. The Royal Question centered, not so much around the surrender of the Army, but Leopold's refusal to leave the country and form a government in exile as had Wilhelmina of the Netherlands. Leopold gave himself up to the Germans in order to alleviate, as he maintained, the sufferings of his people. Additionally, during the war the King, whose



consort had been killed a few years earlier, married a Belgian commoner. This aroused opposition from many who had greatly admired his first wife and thought it inappropriate to remarry during the war. Moreover, the King was comfortably detained in one of his palaces near Brugge while his troops were taken to Germany. Documentary evidence does not provide sufficient data to tell how successful Leopold's efforts were at trying to relieve the suffering of his people, but many Belgians considered he had collaborated with the Germans. After the Normandy landings of the allies, he had been removed as a prisoner to Austria. When he wanted to return in 1945, it became evident that no hero's welcome awaited him. The country was split between those who favored his restoration and those who opposed his return. In March 1950 a referendum showed a narrow majority of Belgians were willing to accept Leopold III as King again. Unfortunately, only in Flemish provinces did a sufficient plurality of affirmative votes exist. Leopold suddenly returned and was greeted by widespread strikes and rioting. The government was forced to recognize that the only way to prevent a civil war was for Leopold to abdicate. Even many former supporters were forced to admit the impossibility of Leopold's retention of the throne. By late 1950 Leopold announced his intention to abdicate in favor of his son. In July 1951 the Royal Prince Baudouin was crowned King of the Belgians and the Royal Question gradually receded into history.

62. Anrys, Conge Pour Mourir, p. 452. Zeemacht, literally translated means "seapower" and is the Dutch language name for the Belgian Navy. "Force Navale" is the French language equivalent of "seapower" and is used by the French-speaking Belgians.
63. Eugene K. Keefe, Area Handbook for Belgium, (Washington: U.S. Government Printing Office, 1974), p. 221.
64. ZM-FM: 1946-1971, Staf van de Zeemacht, (Brussel: Drukkerij van de Krijgsmacht, 1971), p. 22.
65. Ibid., pp. 22-26.
66. De Belgische Zeemacht, p. 19.
67. ZM-FN: 1946-1971, p. 26; De Belgische Zeemacht, p. 11.
68. ZM-FN: 1946-1971, pp. 26-27.
69. Ibid., p. 33.



70. "De Zeemacht en Haar Toekomst," VOX: Militair Weekblad, (Vol. 2, No. 18, 15 May 1975), p. 12.
71. J.J. Branigan, Europe: Excluding the British Isles and U.S.S.R., The New Certificate Geography Series: Advanced Level, (Norwich, Great Britain: Fletcher and Son, LTD.), p. 1.
72. Gordon L. Weil, The BENELUX Nations: The Politics of Small-Country Democracies, (New York: Holt, Rhinehart and Winston, 1970), p. 213.
73. Keefe, Area Handbook for Belgium, pp. 34, 54.
74. Ibid., p. 54.
75. Branigan, Europe: Excluding the British Isles and U.S.S.R., p. 177.
76. Keefe, Area Handbook for Belgium, p. 194.
77. Maritime Transport 1973, Organization for Economic Co-Operation and Development, (Paris: OECD, 1974), pp. 104-113, 19-46.
78. Lloyd's Register of Shipping - Statistical Tables 1977, (London: Lloyd's Register Shipping Information Services, November 1977), p. 66.
79. Alain C. Enthoven, "U.S. Forces in Europe: How Many? Doing What?," Foreign Affairs, July 1975, p. 521.
80. Witboek van Landsverdediging, Ministerie van Landsverdediging, (Brussel: Drukkerij van de Krijgsmacht, 1977), pp. 41-42.
81. G. B. Howard, "The Role of Belgium in NATO," Military Review, (July 1971), p. 22.
82. Witboek van Landsverdediging, pp. 44-45.
83. "Reunion d'Information Force Navale," Staf van de Zeemacht, Information Day Presentation sheets, Part A: Operaties, (25 January 1978), p. 7.
84. "Naar Het Voorbeeld van de NAVO: STANAVFORCHAN," VOX: Militair Weekblad, (Vol. 3, No. 33, 23 September 1976), p. 31.
85. Alfred T. Mahan, The Influence of Sea Power upon History, 1660-1783, (1890), (London: Methuen, 1965), Chapter 1.

86. Ken Booth, Navies and Foreign Policy, (New York: Crane, Russak, 1977), pp. 117-118.
87. "Nation Maritime a' Climat Continental ou Nation Continental a' Climat Maritime?," Neptunus, (November 1966), p. 13.
88. Ibid.
89. The Hudson Bay averaging 121 feet and the Baltic with a depth of 180 feet are the other two major shallow water maritime routes.
90. Michael Salitter and Ulrich Weisser, "Shallow Water Warfare in Northern Europe," U.S. Naval Institute Proceedings, (March 1977), p. 44.
91. Staf Chef van de Zeemacht Letter dated 29 August 1978, Director of Plans and Programs. Subject: Plans, Programmes, and Operations of the Belgian Navy.
92. "Een Greep uit Vredestijd," VOX: Militair Weekblad, (Vol. 3, No. 33, 23 September 1976), p. 21.
93. Lloyd's Register of Shipping - Statistical Tables 1977, p. 6. Lloyd's Register includes only vessels of greater than 100 gross registered tons. The exact number of fishing vessels in Belgium was provided by the Belgian Navy, Director of Plans and Programmes.
94. Staf Chef van de Zeemacht Letter dated 29 August 1978.
95. Giulio Pontecorno, ed., Fisheries Conflicts in the North Atlantic: Problems of Management and Jurisdiction, (Cambridge: Ballinger, 1974), p. 55.
96. Ibid.
97. "Reunion d'Information Force Navale," p. 1.
98. Vander Sande, "Waarom een Zeemacht?," p. 2.
99. "Reunion d'Information Force Navale," p. 2.
100. Ibid.
101. Stansfield Turner, "Missions of the U.S. Navy," Naval War College Review, (March-April 1974), p. 7.
102. Booth, Navies and Foreign Policy, pp. 117-119.
103. North Atlantic Treaty Organization: Facts about NATO, Chapter 4, Annex C.

104. "Reunion d'Information Force Navale," pp. 6-7.
105. "Een Greep uit Vredestijd," p. 20.
106. Vander Sande, "Waarom een Zeemacht?," pp. 2-3. The initial pollution control efforts of the Belgian Navy began in 1961 when the BNS Knokke conducted extensive Tests with the ESSO oil company and several major chemical producers in attempting to control oil pollution during the Torrey Canyon Disaster.
107. "The Missions of the Belgian Navy," Staf van de Zeemacht, (Brussel: undated), p. 3.; Howard, "The Role of Belgium in NATO," pp. 21-22.
108. Staf Chef van de Zeemacht Letter dated 29 August 1978.; "The Missions of the Belgian Navy," p. 4. The author has personally used charts produced by the Mine Warfare School and found them to be far superior to any existing navigational charts.
109. Staf Chef van de Zeemacht Letter dated 29 August 1978.
110. Hill, "The Role of Navies," p. 104.
111. This is speculation on the part of the author as the Belgian Navy refers all questions dealing with foreign affairs to the Ministry of Foreign Affairs and hesitates to answer questions dealing with these matters.
112. "Reunion d'Information Force Navale," Staf van de Zeemacht, Information Day Presentation sheets, Part C: Personnel, p. 1.
113. "Nation Maritime a' Climat Continental ou Nation Continental a' Climat Maritime?," p. 11.
114. "Reunion d'Information Force Navale," Part A: Operaties.
115. These percentages are based upon the Operational Program of the Belgian Fleet provided by the Belgian Navy and the author's diary for the calendar year 1976. Approximately 12 percent of the operating time was in the local operating areas off the Belgian coast.
116. Operationele Richtlijnen Voor 1977, Krijgsmacht, Generale Staf, Staf van de Zeemacht: Sectie Operaties, 1977, pp. I-1 - D-1.



117. J.P.L. Van Dyck, "Editoriaal," VOX: Militair Weekblad, (Vol. 4, No. 44, 8 December 1977), pp. 2-3.
118. Vander Sande, "Waarom een Zeemacht?," p. 2. See also note 62.
119. "Dertig Jaar en Meer," VOX: Militair Weekblad, (Vol. 3, No. 33, 23 September 1976), p. 5.
120. "Nation Maritime á Climat Continental ou Nation Continental á Climat Maritime?," pp. 10-13. The 45 minesweepers include 7 Ocean, 22 Coastal, and 16 Inshore Minesweepers. Many of these vessels were built with United States credits under either the MDAP or Off-Shore Procurement Programs. All of the Inshore Minesweepers were built in Belgium, half under U.S. credits and the remainder with national credit.
121. J.P.L. Van Dyck, "Bezoek van Z.M. De Koning aan de Zeemacht," unpublished address presented by the Chief of the Belgian Naval Staff to His Royal Highness, the King of the Belgians, 24 September 1974, p. 2.
122. "The Belgian Navy's New E-71 Class-Frigate," International Defense Review, (May 1977), p. 956.
123. "History of the Belgian Navy," p. 3.
124. Roy Corlett, "Belgian E71 Wielingen-Class Frigate: An Operational Critique," Maritime Defense, (September 1977), p. 305.
125. Staf Chef van de Zeemacht Letter dated 29 August 1978, p. 3.
126. Ibid.
127. Arthur Davidson Baker, "Small Combatants - 1973," U.S. Naval Institute Proceedings, (May 1973), P. 247.
128. "The Belgian Navy's New E-71 Class-Frigate," p. 958.
129. J.P.L. Van Dyck, "The E-71 Programme: An Example of Close Cooperation between Sister Navies," unpublished address presented by the Chief of the Belgian Naval Staff at the United States Naval War College, Newport, Rhode Island, 1976, p. 11.
130. Ibid., p. 13.
131. J.P.L. Van Dyck, "Bezoek van Z.M. De Koning aan de Zeemacht," p. 6.



132. "Reunion d'Information Force Navale," Part A: Operaties, p. 7.
133. Weeks, The Significance of Soviet Mining Against NATO Sea Lines of Communications, p. 55.
134. See Chapter V for a detailed discussion of the training and services provided by the Belgian-Netherlands Mine Warfare School at Ostend.
135. "New Belgian Navy Ship," U.S. Naval Institute Proceedings, (January 1969), p. 151.
136. "The Means Available to Accomplishment the War-time and Peace-time Missions of the Belgian Navy," p. 1.
137. ZM-FN: 1946-1971, p. 29.
138. "Mijnenbestrijding," VOX: Militari Weekblad, (Vol. 3, No. 33, 23 September 1976), p. 28. The primary reasons that PAP significantly speeds-up the minehunting operation are: 1) the much slower diver-vector method is unnecessary, 2) the mine-like contacts which prove to be "non-mine" are rapidly viewed on the closed-circuit television, plotted, and past over, 3) the PAP is not constrained as severely by the strong tidal currents and sea states prevalent in the Belgian coastal area whereas divers are unable to dive on contacts when the current is greater than one knot, or in a sea state greater than three on the Beaufort scale, 4) the PAP does not suffer from diver fatigue during long operations, and 5) lost time due to diving accidents is avoided since divers are not used. The new Trinational MCMV discussed below will utilize the French side-scanning DUBM 21A sonar with two sonar beams. This will further expedite the operation by guiding the device with one beam while maintaining the contact in the second beam. At present the PAP operator must steer the device in the general direction of the sonar beam until it appears on the scope.
139. Depending upon the length and type of sweep veered, an MSO or MSC might require a larger turning area than allowed by the geographical constraints. The MSI is scaled down to the proper size for river and harbor usage allowing greater flexibility of maneuver. Minehunting would be ideal for harbors and rivers except that these waters usually provide excellent mine burial characteristics due to muddy bottoms and silting. Thus, small sweepers must be used as even helicopter MCM techniques are poorly suited in areas with many bridges, locks and pier protuberances.

140. Witboek van Landsverdediging, p. 76.
141. "De Zeemacht en Haar Toekomst," p. 13.
142. Van Dyck, "Editoriaal," p. 3.
143. "Reunion d'Information Force Navale," Part D: Programme Chasseur de Mines Tripartite, p. 2.
144. Van Dyck, "Editoriaal," p. 3.
145. "Future Developments in the Belgian Navy," Staf van de Zeemacht, Public Relations Dienst, 1977, p. 1.
146. Witboek van Landsverdediging, p. 74.
147. Parenthetically it must be noted that during this writer's tour with the Belgian Navy, several higher ranking US Navy officers stressed privately the desire to have U.S. exchange personnel serve on the Belgian Frigates once operational. In view of the US Navy's lip-service to mine warfare, I feel it is best for U.S. personnel to continue serving in the Belgian MCM fleet where they will obtain an appreciation of the mine threat and how to counter that threat. Additionally, in view of the Trinational Minehunting Program, an opportunity to place US Navy personnel on these new MCMVs can only be considered a rare opportunity to participate in MCM at its best.
148. "Operational Training," Staf van de Zeemacht, undated, p. 1.
149. Witboek van Landsverdediging, p. 75.
150. See note 61.
151. Weil, The Benelux Nations: The Politics of Small-Country Democracies, pp. 157-158.
152. Witboek van Landsverdediging, pp. 49-52.
153. Keefe, Area Handbook for Belgium, p. 233.
154. Witboek van Landsverdediging, pp. 51-52.
155. "Reunion d'Information Force Navale," Part C: Personnel, p. 2.; "The Means Available to Accomplish the Wartime and Peacetime Missions of the Belgian Navy," p. 13.

156. "Algemeenheden Nopens De Organizatie van de Zeemacht," Staf van de Zeemacht. Unpublished and undated information sheets on the organization of the Belgian Navy, p. II-2.
157. "Organization COMOPSNNAV," Staf van de Zeemacht, COMOPSNNAV: Sectie Operaties, undated, p. 1.
158. Ibid., pp. 1-2.
159. "ZEEBRUGGE," VOX: Militair Weekblad, (Vol. 3, No. 33, 23 September 1976), p. 20.
160. "Organization COMPOSNAV," pp. 1-2. Nieuwpoort was formerly the homeport for inshore minesweepers which are now stationed in Antwerp. The Nautical School and a slipway are still utilized, although the base was placed in reserve under the navy's plan to consolidate its facilities with the 1977 opening of the new base at Zeebrugge.
161. "The Means Available to Accomplish the Wartime and Peacetime Missions of the Belgian Navy," p. 13.
162. "Oostende Linkeroever," VOX: Militair Weekblad, (Vol. 3, No. 33, 23 September 1976), P. 10.
163. Van Dyck, "The E-71 Programme: An Example of Close Cooperation between Sister Navies," pp. 15-16.
164. "Welkom aan boord A 960 Godetia," p. 6.
165. During the author's two years with the Belgian Navy he assisted in many material and administrative inspections as Comflot 22 Operations Officer. Additionally, the author was executive officer of the USS Inflict (MSO-456) in 1973-1974. With that background the author feels competent to compare Belgian and U.S. Navy MCM vessels.
166. The exercise referred to is NORMINEX-1977, an annual French Navy MCM exercise. Repair teams on the FLOT 22 command ship consists of personnel from the ship's company, the Comflot staff, and COMLOGNAV. This represents a judicious utilization of personnel as technicians are embarked as required for out of area deployments. At other times they are available to the entire fleet though COMLOGNAV.
167. "Oostende Linkeroever," p. 11.
168. "Algemeenheden Nopens De Organisatie van de Zeemacht," p. II-7.



169. It is difficult to compare COMLOGNAV with U.S. Navy facilities since U.S. Navy minesweepers held a low priority on many types of repairs compared to cruisers, destroyers and carriers at facilities frequented by the author while serving on USS Inflict (MSO-456) when it was forward deployed and homeported in Guam, M.I. COMLOGNAV, on the other hand, is oriented toward the Belgian fleet which consists primarily of MCMVs. The quality of the work is easier to assess and it is the opinion of this writer that, for MCMV's, COMLOGNAV's work is far superior in quality and quantity to that of the U.S. Navy.
170. "The Means Available to Accomplish the Wartime and Peacetime Missions of the Belgian Navy," p. 13. This undoubtedly reflects also the increasing complexity of training required in many specialized areas.
171. Van Dyck, "The E-71 Programme: An Example of Close Cooperation between Sister Navies," p. 15.
172. JOB ZM: VAAR ZEEMACHT, Public Relations Dienst van de Zeemacht, undated, p. 3.
173. B. Geeraerd, "Sint-Kruis-Brugge: Vooraleer Zee te Kiezen," VOX: Militair Weekblad, (Vol. 2, No. 18, 15 May 1975), p. 11. General categories of naval ratings are distributed among the schools as follows:
- Deck School: communications, radar and sonar detection, gunnery, and safety.
 - Engineering School: electrical repair, electronic repair, enginemen, ship repair technicians.
 - Service School: Administrative services, supply, messmen, cooks.
174. De Belgische Zeemacht, p. 21.
175. "Een Greep uit Vredestijd," p. 21.; Staf Chef van de Zeemacht Letter dated 12 October 1978, Director of Plans and Programs. Subject: Plans, Programmes, and Operations of the Belgian Navy, p. 7.
176. Paul O'Connor, "The New Belgian Minewarfare School," Naval Training Bulletin, (Summer 1959), p. 20.
177. "The Belgian-Netherlands Mine Warfare School: EGUERMIN," Belgium-Netherlands Mine Warfare School, Marinekazerne Bootsman Jonsen, Oostende, Belgium, undated, p. 1. Very little documentation concerning EGUERMIN exists outside European NATO navies, hence,

the material in this section is adapted from the material provided by EGUERMIN and the Belgian Navy. Additionally, the author dealt extensively with the Mine Warfare School in his capacity as Operations and MCM Officer of Comflot 22.

178. Ibid.
179. De Belgische Zeemacht, p. 52.
180. "The Belgian-Netherlands Mine Warfare School: EGUERMIN," p. 3.
181. Staf Chef van de Zeemacht Letter dated 12 October 1978, p. 2.
182. Witboek van Landsverdediging, p. 73.; Staf Chef van de Zeemacht Letter dated 12 October 1978, p. 1.
183. Staf Chef van de Zeemacht Letter dated 16 February 1979, Director of Plans and Programs. Subject: Composition of the General Staff, p. 2.
184. Staf Chef van de Zeemacht Letter dated 12 October 1978, p. 7.
185. "Nation Maritime a Climat Continental ou Nation Continental a Climat Maritime?," p. 17. Approximately 14 new officers enter the navy each year.
186. Witboek van Landsverdediging, p. 127.
187. ZM-FN: 1946-1971, p. 36.
188. Staf Chef van de Zeemacht Letter dated 12 October 1978, p. 2.
189. Ibid., All of the following information was provided by the Director of Plans and Programs Belgian Navy.
190. Geeraerd, "Sint-Kruis-Brugge: Vooraleer Zee te Kiezen," p. 13.
191. Van Dyck, "The E-71 Programme: An Example of Close Cooperation between Sister Navies," p. 15.
192. Keefe, Area Handbook for Belgium, pp. 96-97.
193. Witboek van Landsverdediging, pp. 122-123.
194. Staf Chef van de Zeemacht Letter dated 12 October 1978, p. 2.

195. Geeraerd, "Sint-Kruis-Brugge: Vooraleer Zee te Kiezen," p. 11.
196. Witboek van Landsverdediging, p. 125.
197. Geeraerd, "Sint-Kruis-Brugge: Vooraleer Zee te Kiezen," p. 11.
198. Keefe, Area Handbook for Belgium, p. 66.
199. Ibid., p. 38.
200. Witboek van Landsverdediging, pp. 109-120.
201. Operationele Richtlijnen Voor 1977, p. II-1.
202. "Nation Maritime á Climat Continental ou Nation Continental á Climat Maritime?," pp. 3-4, 10.
203. "Familieportret," pp. 15-19.; Vander Sande, "Familieportret," pp. 7-10.; "Reunion d'Information Force Navale," Part D: Programme Chasseur de mines Tripartite, p. 2.
204. "Programme Fregates: Situation au 29 Janvier 1978," Staf van de Zeemacht, unpublished information sheets provided by the Belgian Navy, p. 5.
205. Witboek van Landsverdediging, pp. 109-120. This program was to take effect on 31 December 1978 but has been indefinitely postponed. It will probably not be implemented until after 1981.
206. Staf Chef van de Zeemacht Letter dated 12 October 1978, p. 8.
207. Witboek van Landsverdediging, p. 116.
208. "Reunion d'Information Force Navale," Part C: Personnel, pp. 3-4.
209. Victor Werner, "Syndicalism in the Belgian Armed Forces," Armed Forces and Society, (Vol. 2, No. 4, August 1976), p. 477. This entire section is adapted from Werner's history and development of syndicalism in Belgium and personal correspondence with officials of the Belgian Navy.
210. It would appear that with the abdication of Leopold III, the armed forces lost all hope of regaining its former prestige.

- 211. Keefe, Area Handbook for Belgium, p. 223.
- 212. Werner, "Syndicalism in the Belgian Armed Forces," p. 480.
- 213. Ibid.
- 214. Ibid., p. 489.
- 215. Staf Chef van de Zeemacht Letter dated 12 October 1978, p. 6.
- 216. Witboek van Landsverdediging, pp. 131-133. Military personnel may join any political party and fill the functions of an expert, counselor, or member of a study center. No active or public participation in political life is permitted.
- 217. Werner, "Syndicalism in the Belgian Armed Forces," p. 485.
- 218. Ibid., p. 488.
- 219. Staf Chef van de Zeemacht Letter dated 12 October 1978, p. 6.
- 220. Staf Chef van de Zeemacht Letter dated 16 February 1979, Director of Plans and Programs. Subject: Belgian Naval Personnel, participation in military unions.
- 221. Keefe, Area Handbook for Belgium, p. 231.
- 222. Witboek van Landsverdediging, p. 96.
- 223. Ibid., p. 97.
- 224. Ibid., p. 89. Figures presented in this section are from the Belgian Ministry of Defense Whitebook on National Defense and vary slightly from other published data such as the U.S. Arms Control and Disarmament Agency and the Stockholm International Peace Research Institute. Nevertheless, all sources substantiate the general downward trends in defense expenditures.
- 225. ZM-FN: 1946-1971, p. 27.
- 226. Van Dyck, "Bezoek van Z.M. De Koning aan de Zeemacht," p. 6.
- 227. Ibid., pp. 2-4
- 228. Witboek van Landsverdediging, p. 104.

229. Salitter and Weisser, "Shallow Water Warfare in Northern Europe," pp. 38-44.
230. Witboek van Landsverdediging 1977, pp. 49-77.
231. Naturally, this is a simplistic statement based only upon numbers. No one can categorically state the relative value of a particular ship-type versus one of another type. For example, it is impossible to state that a nuclear aircraft carrier is worth X number of Soviet cruisers. Nevertheless, a carrier or any other type of ship can only be in one location at a time. Consequently many naval warfare planners express great concern over the number of ships available to NATO vis-a-vis the size of the Soviet fleet.
232. Leon Sloss, NATO Reform: Prospects and Priorities, The Washington Papers, (Volume III, No. 30, Beverly Hills: Sage 1975P, pp. 55-56.
233. "Welkom aan boord A 961 Zinnia," p. 11. Author's translation: "Wanneer de natie een brandkast is, dan zijn de koopvaardij en de militaire marine het slot en de sleutel."

BIBLIOGRAPHY

- A-960 Godetia: Welkom Aanboord. Staf van de Zeemacht.
Welcome aboard booklet of the Belgian Navy ship
Godetia, 1971.
- A-961 Zinnia: Welkom Aanboord. Staf van de Zeemacht.
Welcome Aboard booklet of the Belgian Navy ship
Zinnia, Oostende: Drukkerij De Vuurtoren, undated.
- "Air Forces of the World." Intervavia, (Vol. XXVII, No.9,
23 September 1973): 1003.
- "Algemeenheden Nopens De Organisatie van de Zeemacht."
Staf van de Zeemacht. Unpublished and undated
information sheets on the organization of the Belgian
Navy.
- Anrys, Henri. Conge Pour Mourir: Les Belges Dans La
Guerre Navale 1939-1945. Bruxelles: Pierre De
Meyers, 1975.
- Arango, E. Ramon. Leopold III and the Belgian Royal
Question. Baltimore: John Hopkins Press, 1961.
- Baker, Arthur Davidson. "Small Combatants - 1973."
United States Naval Institute Proceedings, Naval
Review, (May 1973): 238-258.
- Belgian Navy: De Schepen van de Belgische Zeemacht van
1946 tot Vandaag. Staf van de Zeemacht. Twenty-fifth
anniversary booklet of the Belgian Navy, 1971.
- "Belgium's 'Annapolis,' The Barquentine 'Mercator'."
Navy: The Magazine of Seapower, (September 1959): 21.
- Bienvenue a Bord: Dragueurs Cotiers de la Classe MCS.
Staf van de Zeemacht. Welcome Aboard booklet for the
Belgian coastal minesweepers, undated.
- Bienvenue a Bord Dragueurs de Petits Fonds de la Classe MSI.
Staf van de Zeemacht. Welcome Aboard booklet for the
Belgian inshore minesweepers, undated.
- Booth, Ken. Navies and Foreign Policy. New York: Crane,
Russak, 1977.



- Branigan, J.J. Europe: Excluding the British Isles and U.S.S.R. The New Certificate Geography Series: Advanced Level. Norwich, Great Britain: Fletcher and Son Ltd., 1976.
- Chase, John D. "The Function of the Navy." United States Naval Institute Proceedings, (October 1969): 27-33.
- "Connaissez-Vous Votre Marine?" Public Relations Dienst van de Zeemacht, undated.
- Corlett, Roy. "Belgian E71 'Wielingen'-Class Frigate: An Operational Critique." Maritime Defense, (September 1977): 305-306.
- Cowie, J.S. Mines, Minelayers and Minelaying. London: Oxford University Press, 1951.
- "Damars : Objectief 1978." VOX: Militair Weekblad, (Vol. 4, No. 4, 8 December 1977): 20-21.
- De Belgische Zeemacht. Dienst Informatie van de Zeemacht, Brussel: Drukkerij Rossel, July 1965.
- De D.E.R. in 1978. BE-NL Mijnenbestrijdingsschool, Oostende, België: Eguermijn, November 1977.
- "De Fregatten E71." VOX: Militair Weekblad, (Vol. 3, No. 33, 23 September 1976): 14.
- "De Groepering Operaties." VOX: Militair Weekblad, (Vol. 2, no. 18, 15 May 1975): 4-5.
- "De Groepering Operaties." VOX: Militair Weekblad, (Vol. 3, No. 33, 23 September 1976): 8-9.
- De Meemus, Adrien. History of the Belgians. New York: Praeger, 1962.
- Demographic Yearbook - 1972. United Nations, New York: United Nations, 1973.
- "De Nieuwe Fregatten E 71 van de Zeemacht, Mensen, Techniek en Management." VOX: Militair Weekblad, (Vol. No. 44, 8 December 1977): 4-13.
- Depuy, T.N.; Hayes, Grace P.; and Andrews, John A.C. The Almanac of World Military Power. New York: R.R. Bowker, 1974.
- "Dertig Jaar en Meer." VOX: Militair Weekblad, (Vol. 3, No. 33, 23 September 1976): 2-7.

"De Zeemacht en de NAVO." VOX: Militair Weekblad, (Vol. 2, No. 18, 15 May 1975): 16.

"De Zeemacht en Haar Toekomst." VOX: Militair Weekblad, (Vol. 2, No. 18, 15 May 1975): 12-13

"De Zeemacht is Geen Openbare Dienst...Ze Staat in Dienst van het Publiek." Staf van de Zeemacht, Informatie Informatie en Publieke Betrekkingen, Oostende: Cailliau, undated.

Drummond, S.H., "The Sea Life-Lines of Britain and Her Neighbors." Brassey's Annual: Defense and the Armed Forces, (1969): 87-111.

"Een Greep uit 'Vredestijd'." VOX: Militair Weekblad, (Vol. 3, No. 33, 23 September 1976): 20-24.

"Een Koekoekswapen." VOX: Militair Weekblad, (Vol. 4, No. 44, 8 December 1977): 18-19

"Een Terugblik OP...Royal Navy Section Belge." Staf van de Zeemacht, Public Relations Dienst, undated.

Engelen, A. "De Logistieke Groepering." VOX: Militair Weekblad, (Vol. 2, No. 18, 15 May 1975): 5-6.

Enthoven, Alain C. "U.S. Forces in Europe: How Many? Doing What?" Foreign Affairs, (July 1975): 513-532.

Europa Yearbook: 1976. London: Europa Publications Limited, 1977.

Eyck, F. Gunther. The Benelux Countries: An Historical Survey. New York: D. Van Nostrand, 1959.

"Familieportret." VOX: Militair Weekblad, (Vol. 3, No. 33, 23 September 1976): 15-19.

"Future Developments in the Belgian Navy." Staf van de Zeemacht, Public Relations Dienst, 1977.

Geeraerd, B. "Sint-Kruis-Brugge: Vooraleer Zee te Kiezen!" VOX: Militair Weekblad. (Vol. 2, No. 18, 15 May 1975): 11.

Gleissner, J. "Belgie: Kleine Zeemogenheid: De Marine was Steeds het zwart Schaap." Gazet van Antwerpen, (3 January 1967): 1.

_____. "Belgie: Kleine Zeemogenheid: Eerste Eenheden Waren 'Afdankertjes'." Gazet van Antwerpen, (30 December 1966): 1.

- _____
"Belgie: Kleine Zeemogenheid: Eindelijk een
Volwaardige Navy." Gazet van Antwerpen, 4 January
1967): 1.
- _____
"Belgie: Kleine Zeemogenheid: Koninklijke Marine
Werd Door Politieke Landrotten Gekelderd." Gazet
van Antwerpen, 31 December 1966): 1.
- Goris, Jan-Albert. Belgium. Los Angeles: University of
California Press, 1946.
- Hill, J.R. "The Role of Navies." Brassey's Annual:
The Armed Forces Yearbook, (1960): 91-107.
- "History and Description of the Zinnia." Official Press
Release of the Belgian Naval Ship Zinnia (A-961),
Stockholm, Sweden, 27 May 1969.
- "History of the Belgian Navy." Staf van de Zeemacht,
Public Relations Dienst, undated.
- Hoffman, Roy F. "Offensive Mine Warfare: A Forgotten
Strategy." United States Naval Institute Proceedings,
(May 1977): 142-155.
- Howard, G.B. "The Role of Belgium in NATO." Military
Review, (July 1971): 17-22.
- Hurford, G.H. "Naval Losses in the War." Brassey's Annual:
The Armed Forces Yearbook, (1946): 151-160.
- International Shipping and Shipbuilding Directory 1976.
London: Benn Brothers, 1976.
- JOB ZM: Vaar Zeemacht. Public Relations Dienst van de
Zeemacht, undated.
- Keefe, Eugene K., Editor. Area Handbook for Belgium.
Washington: United States Government Printing Office,
1974.
- Ken Je de Zeven Zeeen? Staf van de Zeemacht, Public Re-
lations Dienst, Brussel, undated.
- Langer, William L. An Encyclopedia of World History.
Fifth Edition. Boston: Houghton Mifflin, 1972.
- Leconte, L. De Voorouders van Onze Zeemacht. Ministerie
van Landsverdediging, Dienst voor Opvoeding bij het
Leger, 1948.
- _____
Les Ancestres de Notre Force Navale. Bruxelles:
Etablissements Pauwels Fils, 1952.

Lloyd's Register of Shipping Statistical Tables 1977. London
Lloyds Register Shipping Information Services,
November 1977.

Luttwak, Edward N. The Political Uses of Sea Power.
Baltimore: Johns Hopkins Press, 1974.

Mahan, Alfred T. The Influence of Sea Power upon History,
1960-1783 (1890). London: Methuen, 1965.

Maritime Transport 1973. Organization for Economic Co-
Operation and Development, Paris: OECD, 1974.

"Met de Vliegers van de Zeemacht: De Helikopterploeg."
VOX: Militair Weekblad, (Vol. 4, No. 44, 8 December
1977): 14-16.

"Mijnenbestrijding." VOX: Militair Weekblad, (Vol. 3,
No. 33, 23 September 1976): 28-30.

"Mine Warfare at Sea." Brassey's Annual: The Armed
Forces Yearbook, (1967): 311-319.

"Naar het Voorbeeld van de NAVO: STANAVFORCHAN." VOX:
Militair Weekblad, (Vol. 3, No. 33, 23 September 1976):
31.

"National Organization of the Belgian Navy." Staf van de
Zeemacht, Public Relations Dienst, undated.

"Nation Maritime a Climat Continental ou Nation Continentale
a Climat Maritime?" Neptunus, (November 1966): 1-32.

"NATO and Benelux Organization." Staf van de Zeemacht,
Public Relations Dienst, undated.

NATO, Facts and Figures. Brussels: NATO Information
Service, 1965.

Naval Contribution to Deterrence 1975-1980. Center for
Naval Analysis, Study Number 10, Annex D, Cambridge:
Institute of Naval Studies, May 1965.

"New Belgian Navy Ship." United States Naval Institute
Proceedings, (January 1969): 151.

"New Belgian Support and Command Ship." United States
Naval Institute Proceedings; (October 1966): 166.

North Atlantic Treaty Organization: Facts About NATO.
North Atlantic Treaty Organization, Paris: NATO,
1959.

Notre Marine. Publie a l'initiative du Service d'information de la Force Navale, Anvers: S.A. Lithocart, 1971.

O'Connor, Paul. "The New Belgian Minewarfare School." Naval Training Bulletin, (Summer 1959): 20-22

Onze Zeemacht. Staf van de Zeemacht, Public Relations Dienst, Brussels, undated.

"Oostende Linkeroever." VOX: Militair Weekblad, (Vol. 3, No. 33, 23 September 1976): 10-11.

Operationele Richtlijnen Voor 1977. Krijgsmacht, Generale Staf, Staf van de Zeemacht; Sectie Operaties, 1977.

"Operational Training." Staf van de Zeemacht, undated.

"Organization COMOPSNAV." Staf van de Zeemacht, COMOPSNAV: Sectie Operaties, undated.

Pettee, George S.; Angelo, Patricia; and Barber, Edward. Cost to Maintain the Military Forces of Foreign Countries. Research Analysis Corporation, Mclean, Virginia, RAC-ORO-T-307, October 1955.

Pontecorno, Guilio.; Editor. Fisheries Conflicts in the North Atlantic: Problems of Management and Jurisdiction. Cambridge: Ballinger, 1974.

Ports of the World. London: Benn Brothers, 1973.

Power at Sea. The International Institute for Strategic Studies, Adelphi Papers, Number One Hundred and Twenty-two. London: International Institute for Strategic Studies, 1975.

"Programme Fregates: Situation au 20 Janvier 1978." Staf van de Zeemacht, unpublished information sheets provided by the Belgian Navy, 1978.

Quotable Navy Quotes. Department of the Navy, Washington: United States Government Printing Office, 1967.

"Reunion d'information Force Navale." Staf van de Zeemacht, Information Day Presentation Sheets; Part A - Operaties, Part B - Logistieke, Part C - Personnel, Part D - Programme Chasseur de mines Tripartite, 25 January 1978.

Salitter, Michael, and Weisser, Ulrich. "Shallow Water Warfare in Northern Europe." United States Naval Institute Proceedings, (March 1977): 36-45.

Sellers, Robert C. The Reference Handbook of the Armed Forces of the World. New York: Robert C. Sellers and Associates, 1968.

Sloss, Leon. NATO Reform: Prospects and Priorities. The Washington Papers, Volume III, No. 30, Beverly Hills: Sage, 1975.

Staf Chef van de Zeemacht Letter dated 12 October 1978, Director of Plans and Programs. Subject: Plans, Programs, and Operations of the Belgian Navy.

Staf Chef van de Zeemacht Letter dated 29 August 1978, Director of Plans and Programs. Subject: Plans, Programs, and Operations of the Belgian Navy.

Staf Chef van de Zeemacht Letter dated 16 February 1979, Director of Plans and Programs. Subject: Plans, Programs, and Operations of the Belgian Navy.

Statistical Yearbook 1976. United Nations, New York: United Nations, 1977.

Taylor, Jeremy D. "Mining: A Well Reasoned and Circumspect Defense." United States Naval Institute Proceedings, (November 1977): 40-45.

"The Belgian Navy's New E-71 Class-Frigate." International Defense Review, (May 1977): 956-958.

"The Belgian-Netherlands Mine Warfare School: EGUERMIN." Belgium-Netherlands Mine Warfare School, Marinekazerne Bootsman Jonsen, Oostende, Belgium, undated.

"The Means Available to Accomplish the War-time and Peace-time Missions of the Belgian Navy." Staf van de Zeemacht, Brussels, 1978.

The Military Balance: 1977-1978. The International Institute for Strategic Studies, London: Adlard and Sons, 1977.

"The Missions of the Belgian Navy." Staf Chef van de Zeemacht, Brussels, undated.

"The Royal Netherlands Navy." Navy: The Magazine of Sea Power, (November 1962): 29-33.

The World Almanac and Book of Facts. Newspaper Enterprise Association, New York: Newspaper Enterprise Association, 1977.

Turner, Stansfield. "Missions of the U.S. Navy." Naval War College Review, (March-April 1974): 2-17.

United States Congress, House of Representatives, Committee on Foreign Relations. Means of Measuring Naval Power. Washington: United States Government Printing Office, 1974.

Vander Sande, P.P. "1975: Het Jaar van de Vrouw." VOX: Militair Weekblad, (Vol. 2, No. 18, 15 May 1975): 14.

_____. "Familieportret." VOX: Militair Weekblad, (Vol. 2, No. 18, 15 May 1975): 7-10.

_____. "Waarom Een Zeemacht?" VOX: Militair Weekblad, (Vol. 2, No. 18, 15 May 1975): 2-3.

Van Dyck, J.P.L. "Bezoek van Z.M. De Koning aan de Zeemacht." Unpublished address presented by the Chief of the Belgian Naval Staff to His Royal Highness, the King of the Belgians, 24 September 1974.

_____. "Dertig Jaar Zeemacht: Editoriaal." VOX: Militair Weekblad, (Vol. 2, No. 18, 15 May 1975): 1.

_____. "Editoriaal." VOX: Militair Weekblad, (Vol. 4, No. 44, 8 December 1977): 1-4.

_____. "The E-71 Programme: An Example of Close Cooperation Between Sister Navies." Unpublished address presented by the Chief of the Belgian Naval Staff at the United States Naval War College, Newport, Rhode Island, 1976.

Van Grieken, Jean-Paul. "Reeds Met Hun Hart...Op Zee." VOX: Militair Weekblad, (Vol. 3, No. 33, 23 September 1976): 26-27.

Weeks, Floyston A. The Significance of Soviet Mining Against NATO Sea Lines of Communications. Masters Thesis, Naval Postgraduate School, Monterey, California, September 1978.

Weil, Gordon L. The Benelux Nations: The Politics of Small-Country Democracies. New York: Holt, Rhinehart and Winston, 1970.

"Welkom aan boord A-954." Staf van de Zeemacht, Public Relations Dienst, undated.

"Welkom aan boord A-957, Bevoorrader en Schoolschip." Staf van de Zeemacht, Public Relations Dienst, undated.

"Welkom aan boord A 960 Godetia." Neptunus, Brussel: E. Van Haverbeke, 1971.

"Welkom aan boord A 961 Zinnia." Staf van de Zeemacht, Public Relations Dienst, Oostende: Drukkerij De Vuurtoren, undated.

"Welkom aan boord van de Hoogzeemijnenvegers." Staf van de Zeemacht, Brussel: Drukkerij G. Veys, Pittem, 1968.

"Welkom aan boord de Kustbegeleiders." Staf van de Zeemacht, Brussel, undated.

Werner, Victor. "Syndicalism in the Belgian Armed Forces." Armed Forces and Society, (Vol. 2, No. 4, August 1976): 477-495.

Witboek van Landsverdediging: 1977. Ministerie van Landsverdediging, Brussel: Drukkerij van de Krijgsmacht, 1977.

World Military Expenditures and Arms Trade 1963-1973. Arms Control and Disarmament Agency, Washington: United States Government Printing Officer, 1975.

World Military Expenditures and Arms Transfers 1965-1975. Arms Control and Disarmament Agency, Washington: United States Government Printing Office, 1976.

"Zeebrugge." VOX: Militair Weekblad, (Vol. 3, No. 33, 23 September 1976): 12-13.

ZM-FN: 1946-1971. Staf van de Zeemacht, Brussel: Drukkerij van de Krijgsmacht, 1971.

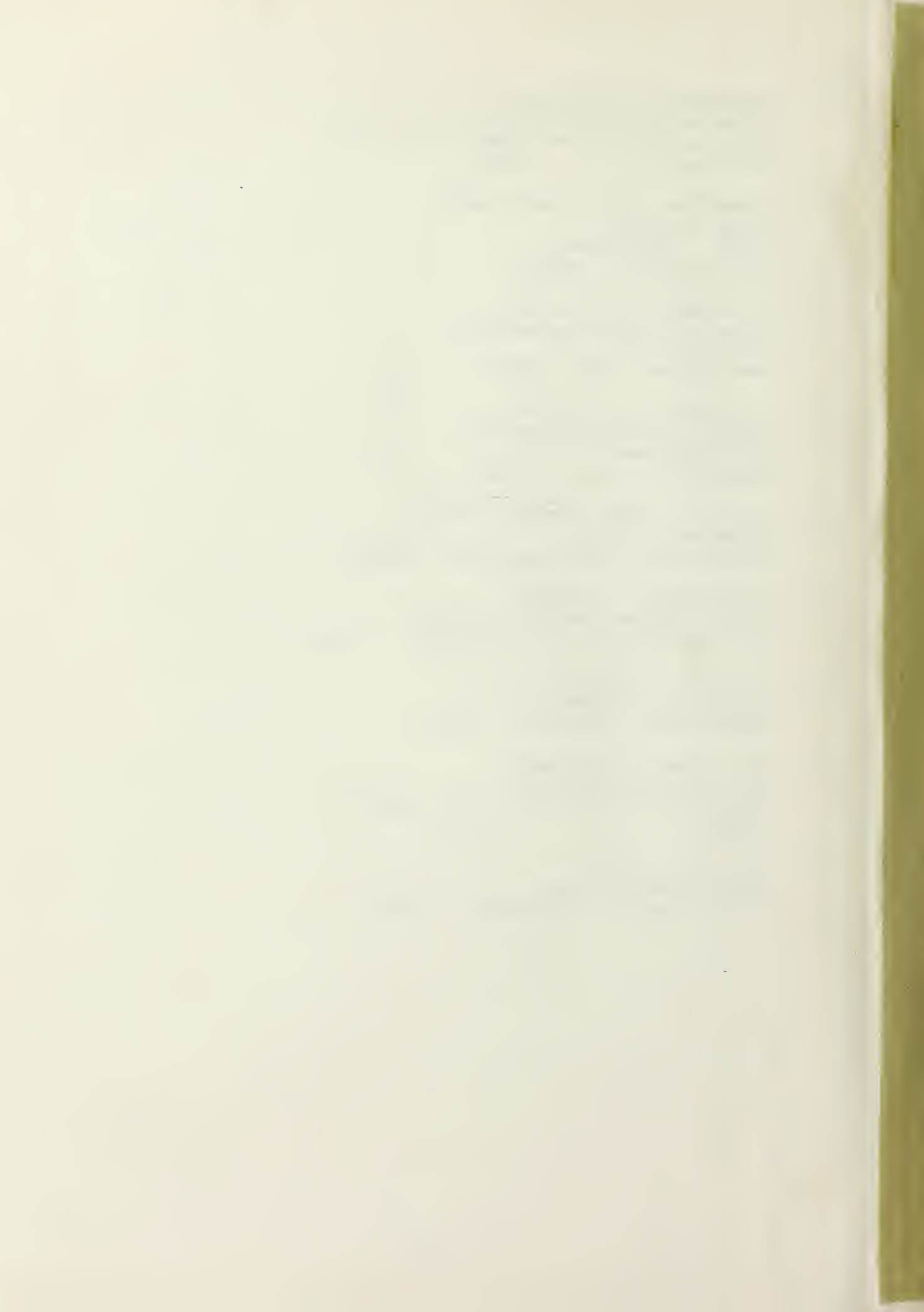
"Zenobe Gramme - Kenmerken en Historie van de A 958 Zenobe Gramme." Staf van de Zeemacht, Brussel: Drukkerij van de Krijgsmacht, 1978.

Zumwalt, Elmo R. On Watch. New York: Quandrangle, 1976.

INITIAL DISTRIBUTION LIST

	No. Copies
1. Defense Documentation Center Cameron Station Alexandria, Virginia 22314	2
2. Library, Code 0142 Naval Postgraduate School Monterey, California 93940	2
3. Department Chairman, Code 56 Department of National Security Affairs Naval Postgraduate School Monterey, California 93940	1
4. Asst Professor D. P. Burke, Code 56 Bq Department of National Security Affairs Naval Postgraduate School Monterey, California 93940	3
5. Vice-Admiral J.P.L. Van Dyck Etat-Major de la Force Navale Le Chef d'Etat-Major Quartier Reine Elisabeth Rue d'Evere 1140 Bruxelles, Belgium	4
6. Capitaine de Fregate W. Cornelis Chef de la Section Plans et Programmes Etat-Major de la Force Navale Quartier Reine Elisabeth 1140 Evere Bruxelles, Belgium	1
7. Commander Naval Operations Zeemacht-Force Navale Marinekazerne Bootsman Jonsen B8400 Oostende, Belgium	1
8. Commandant, BE-NL Mine Warfare School Marinekazerne Bootsman Jonsen B8400 Oostende, Belgium	1

9. Ambassade De Belgique 1
Attache Militaire, Naval et De L'Air
3330 Garfield Street NW
Washington, D.C. 10008
10. Commander Bruce Sunderland 1
Naval Attache
USDAO - US Embassy
APO New York 09667
11. Department of the Navy 1
Chief of Naval Operations
ATTN OP-60
Washington, D.C. 20370
12. Department of the Navy 1
Bureau of Naval Personnel
ATTN PERS-444
Washington, D.C. 20370
13. Commander Mine Warfare Command 1
US Naval Station
Charleston, South Carolina 29408
14. LCDR Thomas R. Mooney 1
Staff Cruiser-Destroyer Group 5
FPO San Francisco, California 96601
15. LT John R. Fitzsimons 1
13217 Kurtz Road
Woodbridge, Virginia 22193
16. Mr. Robert Strijckers 1
4195 Chelsea Crescent
North Vancouver, B.C. V7R 3J4
Canada
17. Mrs. Betty Rees 1
3053 Birdrock Road
Pebble Beach, California 93953



Thesis
M746
c.1

Mooney
The Belgian navy.

182176

19 MAR 80
20 JUN 82
7 DEC 82
APR 16 85

7387
27523
28145
30383

182176
navy.

383

Thesis
M746
c.1

Mooney
The Belgian Navy.

182176

thesM746

The Belgian navy.



3 2768 001 01241 2

DUDLEY KNOX LIBRARY